



INSECUTOR INSCITIZÆ MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. V

JANUARY-MARCH, 1917

Nos. 1-3

244404

Insecutor Inscitiae Menstruus

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TWO BETHYLID PARASITES OF THE PINK BOLL WORM

(Hymenoptera, Bethylinæ)

By S. A. ROHWER

In this paper, which is a contribution from the Branch of Forest Insects, Bureau of Entomology, two Bethylinid parasites of the pink boll worm are discussed. One of them, which has heretofore been considered as *Parasierola cellularis* (Say), is described as new.

Perisierola nigrifemur (Ashmead).

Goniozus nigrifemur Ashmead, Journ. Linn. Soc. Lond., vol. 25, 1894, p. 195.

Parasierola nigrifemur Kieffer, Genera Ins., fasc. 76, 1908, p. 14.

Perisierola nigrifemur Kieffer, Das Tierreich, Lief. 41, 1914, p. 539.

A single female of this was received from E. C. Green, of Brazil, with a note stating that it is parasitic on the larva of the pink boll worm. As this species is but little known the following characters taken from the type will be useful: In Kieffer's key in Das Tierreich will run to *cellularis* Say. Mandibles quadridentate; scape subequal in length with the second and third antennal joints; second antennal joint one-third longer than its apical width; third antennal joint with the apical width slightly greater than the length; third and fourth antennal joints subequal, their length and apical width subequal; ocelli in a curved line, the interocellar line half as long as the postocellar line.

Perisierola emigrata, new species.

Parasierola distinguenda Rohwer, Proc. U. S. Nat. Mus., vol. 41, 1912, p. 448.

Parasierola cellularis Fullaway, Ann. Rept. Haw. Agr. Exp. Sta. for 1912, 1913, p. 24.

Parasierola sp. Swezey, Proc. Haw. Ent. Soc., vol. 3, 1915, p. 101.

This species, which has been reared in great numbers from the larva of the pink boll worm, by August Busck, is, as far as can be made out from the literature, still undescribed. It is apparently very closely allied to *distinguinda* Kieffer (= *cellularis* Kieffer not Say) and is the same as the species recorded under that name in Proc. U. S. Nat. Mus., vol. 41, 1912, p. 448. Compared with Kieffer's description of *distinguinda* (as *cellularis* Say, Berl. Ent. Zeitscher., vol. 50, 105, p. 254) the following differences are noted: Third antennal joint not longer than wide; apical joints of antennæ blackish; four posterior tibiæ mostly black; wing veins very pale brown. From the other bethylid parasite of the pink boll worm, *Perisierola nigrifemur* (Ashmead), it may be distinguished by the relation of the ocelli to each other. In Kieffer's key (Das Tierreich, p. 533) it runs to *cellularis* Say.

Female.—Length 2 mm. Head nearly as wide as the thorax, finely coriaceous and with a few large scattered punctures; ocelli in a low triangle; posterior ocelli less than their width from the occiput; interocellar line more than half as long as postocellar line; clypeal carina strong, complete; scape a trifle longer than second and third joints combined; second joint one-third longer than apical width; third and following joints as long as their apical width; pronotum narrowed anteriorly; thorax shining, with very fine reticulations; dorsal aspect of propodeum shining; posterior aspect shining or finely reticulate and with a faint median furrow; stigma truncate apically, but a very little longer than the parastigma. Black; flagellum except apical four joints, trochanters, and tarsi ferruginous; tibiæ brown, ferruginous at base; wings hyaline, stigma and parastigma dark brown, venation yellowish.

Male.—Length 1.5 mm. Differs from female in being more shining and in the black tibiæ and rather yellowish tarsi.

Honolulu, Hawaii. Described from eleven (one type) females and two (one allotype) males which were reared by August Busck as a parasite of the larva of *Gelechia gossypiella* and

issued July 15, 1915. The specimens from Texas referred to under the name *distinguenda* and recorded as parasites of *Bruchus prosopidis* and *Bruchus* sp. are not considered as part of the type material, but the writer is confident that they are the same species.

NOTES ON PERISIEROLA EMIGRATA ROHWER, A PARASITE OF THE PINK BOLL WORM

(Hymenoptera, Bethyliidæ)

By AUGUST BUSCK

This parasite was first observed in the Hawaiian Islands in 1912 and has undoubtedly been introduced only shortly previous to this time, possibly with the equally accidentally introduced host. It is, however, more probably an American species, introduced in 1910 from Texas in an attempt to establish effective parasites of the seed infesting coleopterous larvæ, which are injurious to the pods of *algaroba* (*Prosopis juliflora*); these trees are grown in the Islands and the pods are collected and used as fodder for cattle. In 1915 it was found rather commonly in all the cotton fields on the Island of Oahu and in the Kona cotton district on Hawaii and it is at present the only parasite of the pink boll worm of any importance. It is, however, by no means an effective check and destroys only a small percentage of the cotton pest. The larva is an external parasite on the full-grown larva of *gossypiella*.

The female works its way through the exit hole, cut by the boll worm before pupation, or through the lint of the opened boll into the cell, in which the boll worm is preparing to pupate, biting a hole in the cocoon, if necessary, with its strong mandibles.

The parasite jumps on the back of the larva, which wriggles violently in an effort to shake its enemy off. It accomplishes this at times or manages to reach and kill the parasite with its jaws, but normally the parasite succeeds in curving its abdomen around to the underside of the caterpillar and paralyzes it by inserting the sting into the nervous system, usually just

behind the thoracic legs. It then assures itself that the paralyzation is completed by biting and pulling the skin of the caterpillar, and after much deliberation it deposits its eggs. These are very large in proportion to the parasite, about one-half millimeter long, oblong oval, glassy white, and are normally placed one on a segment in two longitudinal rows on the underside of the caterpillar.

This, however, is not always the case; sometimes the eggs are placed on the back or on the side of the caterpillar.

Four to six eggs are most commonly laid on one host larva, but in captivity three parasites laid 17 eggs each on three larvæ, two laid 13 eggs, one 11, another 10, and still another 9 on single larvæ. In each case all eggs hatched and developed to imagos. Six to 10 eggs on a larva were repeatedly observed in the field.

These eggs hatch within 24 hours and the light reddish parasitic larvæ insert their heads into the caterpillar and grow rapidly, forming together a rosette on the shriveling body of the host. They become full-grown in two to three days and then spin their cocoons near the host larva. The spinning of the cocoon occupies nearly two days and before it is completed the larva voids a large fluid excrement through an opening left in the as yet unfinished cocoon. These excrements harden into a characteristic bifurcated black substance, which often serves to glue the cocoon to the supporting surface.

When there have been many (8-17) parasites on a single larva their cocoons are flimsy, semitransparent, and white. When only four to six parasites have found nourishment in a single larva they average larger in size and their cocoons are much more substantial and brownish in color.

The pupa of the parasite is at first white with coral red eyes, but turns blackish within a few days. During the summer-time in Honolulu the parasite develops in from 10 to 15 days after the egg is laid, but normally stays for a day within the cocoon, probably in order to harden in safety. The imago lives about two weeks and lays from 20 to 50 eggs, according to the host supply.

A very large percentage of these parasites are females, about 30 to one male, and parthenogenesis was repeatedly observed, seeming in fact to be a normal condition.

Reared females, which had been kept isolated each in a separate vial from the spinning of the cocoon and hence certainly virgins, would pounce at once on a *gossypiella* larva, introduced into the vial, paralyze it, and lay eggs.

These eggs would always hatch, barring accidents, and would commonly produce all female offspring, which in turn would oviposit without copulation and again produce females. Four generations consisting exclusively of females were produced in one experiment from a single unfertilized female.

The life history of this parasite is easily observed in captivity by placing a host larva with the female parasite in a small vial. The parasites issued from caterpillars in stored cotton seeds would not fly away in search of growing cotton, but would search for new victims indoors in seeds. The species is, on the other hand, equally at home outdoors and readily finds its host in the bolls in the fields.

The species is recorded in Hawaiian literature as *Goniozus cellularis* Say.

A CHALCID PARASITE OF THE PINK BOLL WORM

(*Hymenoptera, Chalcididæ*)

By A. A. GIRAULT

Stomatoceras pertorvus, new species.

Female.—Similar to the Indian *sulcatiscutellum* Girault, but the scape, pedicel, funicle 1 (and sometimes 2), tegulæ, tarsi, club, knees and tibia (except middle ones sometimes above in the middle), dark reddish; the infuscation under the marginal vein is wider, and there is a faint loop from it to the costal margin beyond the venation; the post marginal vein is distinctly shorter, and shorter than the marginal; the scutellum has a depression between the end of the median sulcus and the apical plate. About the same otherwise. Types compared.

Two females reared from pupæ of *Gelechia gossypiella*, June 10, 1915, Honolulu, Oahu, Hawaii (August Busck).

Types.—Cat. No. 21045, U. S. Nat. Mus., the specimens on tags, a fore wing and antenna on a slide.

This is the species referred to in the Hawaiian publications as *Hockeria* species.

TWO NEW CRANE-FLIES FROM THE PHILIPPINE ISLANDS

(*Diptera*, *Tipulidæ*)

BY CHARLES P. ALEXANDER

The following new species were included in a collection of crane-flies sent to me for determination by Mr. Nathan Banks. I am indebted to Mr. Banks for the loan of this material and for numerous other favors in the past.

Tribe ANTOCHINI

Genus ORIMARGULA Mik.

1883. *Orimargula* Mik; Wien. Entomol. Zeitung, vol. 2, p. 198.

This genus has long been considered as being synonymous with *Antocha* O. S., but is a valid group. It curiously unites the characters of the more generalized *Antocha* with the specialized groups, *Orimarga* and *Diatrepha*. The only species hitherto described is *O. alpigena* Mik (l. c., p. 199–201, fig. 1) from the Australian Alps.

Orimargula philippina, new species.

Coloration brownish; wings whitish opalescent; the anal angle prominent; the fused portion of $M_3 + Cu_1$ short; basal deflection of Cu_1 far before the fork of M .

Male.—Length, 3 mm.; wing, 4.3 mm. Frontal prolongation of the head reddish brown, the mouth-parts yellower. Antennæ dark brown, the flagellar segments elongate-oval. Head brown (if a bloom is normally present it has been destroyed in the type).

Thorax brown, the pruinosity lacking or destroyed. Halteres brown. Legs yellowish brown, the tarsi darker, wings whitish opalescent; veins dark brown; stigma narrow, quite indistinct. Venation: crossvein r weak, inserted on R_2+3 ; R_4+5 before the $r-m$ crossvein elongate, about three times the length of this crossvein; basal deflection of M_1+2 about equal to $r-m$; petiole of cell M_3 very short, not more than one-half the length of the basal deflection of M_1+2 ; basal deflection of Cu_1 far before the fork of M , this distance equal to about one and one-half the length of the deflection. Anal angle of the wing prominent.

Abdomen brown. Hypopygium with the pleurites elongate, the appendages about half the length of the pleurites.

Holotype, ♂, Manila, Philippine Islands.

Type in the collection of Mr. Banks.

This curious fly differs from *O. alpigena* Mik in the small size and especially in the wing-venation, the elongate basal section of vein R_4+5 , the short petiole of cell M_3 and, especially, the great recession of the basal deflection of Cu_1 , in which character it is very like *Orimarga*. The milky white wings and the prominent anal angle are characters of *Antocha*. I believe *Orimargula* should be considered a valid genus.

Tribe ERIOPTERINI

Genus ERIOPTERA Meigen

Erioptera (*Erioptera*) *luzonica*, new species.

Coloration light yellow; wing strongly suffused with yellowish, the veins darker.

Female.—Length, 5 mm.; wing, 4.5 mm. Rostrum dull yellow; palpi brown. Antennæ brownish yellow, the flagellar segments light brown, the scapal segments more shiny. Head light yellow. Thorax dull yellow, the præscutal stripes rather indistinct, the median stripe broad, dull orange, with a row of about eight stout bristles on either side. Pleura yellow with a sparse grayish white bloom. Halteres dull brownish yellow, brightest at the base, the knob dark brown. Legs dull yellow, the tarsi darkened. Wings narrow for this genus of flies,

light yellow; veins stout, yellowish brown, the cord darkest. Venation normal for this subgenus. Abdominal segments brown, the caudal and lateral margins of the tergites broadly yellow; ovipositor yellow, the tergal valves elongated, strongly up-curved.

Holotype, ♀, Luzon, Philippine Islands.

Paratype, ♀, with the type.

Type in the collection of Mr. Banks.

A NOTE ON CISTHENE

(*Lepidoptera*, *Lithosiidæ*)

By HARRISON G. DYAR

Hampson treated this genus in 1900, in Volume II of the Catalogue Lepidoptera Phalænæ. In his supplementary volume, published in 1914, he places *Ruscido arida* Skinner and *Cisthene major* Rothschild as synonyms of *C. menea* Drury, recognizes *C. argentinensis* Rothschild and *C. triplaga* Hampson, and omits all mention of *C. criton* Druce and *C. hodeva* Druce, doubtless because these last two species were incorrectly referred to this genus and family.

Hampson's table contains some inaccuracies. It may be amended and the new species added as follows:

Fore wing with mesial orange band.

Subterminal band broken into two patches.

Large, stout species; median band broad.....*ruficollis* Hübner

Small, slender species; median band narrow,

argentinensis Rothschild

Subterminal band entire.

Subterminal band wide on costa, cutting across apex and parallel to outer margin below.

Orange band on hind wing broad, half of wing or more,

menea Drury --

Hind wing black with narrow orange band,

cynossema Druce

Subterminal band slender, lunate, uniform.

A yellow subcostal ray on fore wing.....*lunaris* Walker

No yellow subcostal ray.....*monon* Dyar

Subterminal band shortened at tornus, rounded, spot-like.

Abdomen wholly yellow above.

Mesial band of fore wing broad, one-third of wing or more.

Hind wing yellow on basal two-thirds,

prusias Druce

Hind wing with large basal spot, sometimes joining the outer border.....*praxis* Druce

Mesial band of fore wing narrow.

Hind wing yellow on basal half.

Abdomen wholly yellow.....*arida* Skinner

Abdomen dark gray below.....*Chorion* Dyar

Hind wing black with yellow costal mark,

quadrifasciata Walker

Abdomen partly or wholly black above.

Hind wing black with yellow costal mark,

tehuacana Dyar

Hind wing yellow on basal half.....*cypris* Druce

Fore wing without mesial transverse yellow band.

Fore wing with subterminal yellow band.

Fore wing with mesial longitudinal yellow ray through cell.

Mesial ray very broad.....*cynara* Druce

Mesial ray slender or broken.

Subterminal band slender, lunate.....*trisigna* Walter

Subterminal band broken into three spots,

triplaga Hampson

Fore wing without mesial longitudinal ray.....*unicincta* Hampson

Fore wing without subterminal yellow band.....*abdulla* Dyar

Cisthene monon, new species.

Head, thorax, and abdomen yellow above; legs and venter dark gray. Fore wing slaty gray; a narrow yellow mesial band and regular, curved subterminal one, running close to margin, less so at apex. Hind wing with a small gray spot at base, disk broadly yellow, terminal dark gray band reaching nearly half of wing. Expanse, 27 mm.

Type, male, No. 21032, U. S. Nat. Mus.; Merida, Venezuela (S. E. Briceño).

Cisthene chorion, new species.

Head, thorax, and abdomen yellow above, legs and venter dark gray. Fore wing slaty black; a moderately broad yellow

band a little before the middle; subterminal band rather broad, curved, shortened at tornus. Hind wing with a small dark spot at base; outer border broad, covering half of the wing. Expanse, 33 mm.

Type, male, No. 21033, U. S. Nat. Mus.; Guadalajara, Mexico (B. Neumoegen).

A specimen similar to this, except that the abdomen is yellow below, is before me from the Chiricahua National Forest, Arizona (Poling and Duffner). It agrees well with the description of *arida* Skinner, except that it is somewhat larger, and it may be that species. *C. chorion*, also, may be the same as *arida*, but I do not venture to unite them on the material before me. I think that Hampson is clearly wrong in uniting *arida* with *menea*.

Cisthene tehuacana, new species.

Head and thorax yellow; abdomen black above, except at base and tip; legs and venter black. Fore wing black, a little slaty, with narrow mesial yellow band and shortened lunate subterminal one. Hind wing black, a small yellow spot near middle of costa. Expanse, 24 mm.

Type, male, No. 21034, U. S. Nat. Mus.; Tehuacan, Mexico, September, 1910 (R. Müller).

Cisthene abdulla, new species.

Head, thorax, and abdomen black, the costa narrowly yellow in front; legs and venter black. Fore wing black, slightly slaty, base yellow to the middle except a short black dash at base of costa. Hind wing black with a costal yellow ray on basal half. Expanse, 26 mm.

Type, male, No. 21035, U. S. Nat. Mus.; Cuernavaca, Mexico, September, 1914 (R. Müller).

THE MOSQUITOES OF THE MOUNTAINS OF CALIFORNIA

(Diptera, Culicidæ)

BY HARRISON G. DYAR

The territory explored covers the northern half of the Sierra Nevada mountains of California. In a previous paper (Ins. Insc. Mens., iv. 80-90, 1916), I described six new species of *Aedes* occurring there. I will here notice all the species found in the mountains.

***Aedes tahoensis* Dyar.**

In describing this species, I compared it with *lazarensis* Felt & Young and stated that it might be a variety of that species. The comparison should have been with *pullatus* Coquillett. *Pullatus* has the same mesonotal ornamentation as *tahoensis*, running somewhat darker than the specimens from the central Sierras. However, *tahoensis* from the Gold Lake region in Sierra and Plumas Counties is also dark, and there is probably no line of demarcation.

The male genitalia of *tahoensis* have a spine on the basal lobe; *pullatus* is described as without this spine; but a re-examination of the mounts of *pullatus* shows the spine distinctly present. The genitalia, therefore, are the same, and not different, as I was led to suppose when I described the species.

The larva of *tahoensis* has the upper head hair in three, the lower single; *pullatus* has both head hairs multiple.¹ The difference may be bridged by specimens in the intermediate territory; but with present information it is necessary to hold the species separate. *Pullatus* is described from the Kootenai region of British Columbia, in the Selkirk Range. I have *tahoensis* from the northern part of the Sierra Nevada mountains of California and the lower part of the Cascades in Oregon. Careful exploration of the continuation of the Cascade Range

¹*Pullatus* has the upper head hair in fours, rarely in fives; lower head hair in threes.

northward into British Columbia would be very useful in connection with this problem.

The breeding places of *tahoënsis* are peculiar: Closed pools without inlet or outlet, filled by melting snow, which usually become completely dry by the first of July. These pools are due to irregularities in the surface of the ground, where the ground is compact enough to hold snow-water for a few weeks. They have no connection with stream or lakes, though naturally commoner in valleys. They are not marshy, but have firm margins, the water being held as in a bowl. The water is clear and cold, but must be of a comparatively rich nature from its enclosed state. These pools can often be recognized when dry. In August, 1915, I visited Fallen Leaf Lake and located such a hollow. In April, 1916, as expected, I found it full of water with numerous pupæ of *tahoënsis*. This is the only species that I have found in these pools and they are always present in large numbers, making *tahoënsis* the commonest mosquito of the mountains while it lasts. *Pullatus* has the same habit, I believe; but it is now 14 years since I observed *pullatus*, and my recollection is not as perfect as in the case of *tahoënsis*. There is no species found in the east corresponding to *pullatus* or *tahoënsis*.

Specimens before me referable to *tahoënsis* have been taken as follows: Yosemite Valley, California, May 19, 1907 (D. J. Fullaway), May 14 to 19, 1916 (H. G. Dyar); Little Yosemite Valley, California, May 18, 1916 (H. G. Dyar); Fallen Leaf Lake, Lake Tahoe, California, May 27 to June 24, 1916 (H. G. Dyar); Lily Lake, Lake Tahoe, California, June 16, 1916 (H. G. Dyar); Tallac, Lake Tahoe, California, June 17, 1916 (H. G. Dyar); Tahoe Tavern, Lake Tahoe, California, June 20, 1915 (A. K. Fisher); Summit, Placer County, California, July 3 to 7, 1916, July 19, 1915 (H. G. Dyar); Gold Lake Camp, Plumas County, California, July 19 to 22, 1916 (H. G. Dyar); Gold Lake, Sierra County, California, July 20, 1916 (H. G. Dyar); Crater Lake, Oregon, August 16, 1916 (H. G. Dyar).

Certain specimens of *tahoënsis* from Gold Lake develop a

very deceptive resemblance to *trichurus* Dyar, which species occurs in the Kootenai region, by having the mesonotum very dark with a white lateral spot. However, in *trichurus*, there are three impressed dorsal dark bands and the lateral white spot is entirely in front of the lateral groove;¹ in *tohoënsis* there are but two dorsal impressed lines and the white spot is on both sides of the lateral groove.

Aedes hexodontus Dyar.

Comparison of specimens shows that this species is identical in mesonotal coloration with *lazarensis* Felt & Young and *impiger* Walker. The ornamentation is very variable, being golden yellow with two narrow lines of dark brown scales, or wholly golden yellow, or wholly brown. The form with the distinct brown lines resembles *lazarensis*, the form wholly yellow, *impiger*. The larvæ, however, are distinct from both of these species.

The breeding places of *hexodontus* are marshy pools, filled by snow-water, often very shallow, never deep; often small like the hoofprints of cattle. I found *hexodontus* plentiful in some cattle tracks in the edge of a marsh near Tallac on Lake Tahoe. The cattle tracks were filled by spring water; there were no *hexodontus* in the marsh itself, though other mosquito larvæ were there. At the end of Fallen Leaf Lake, *hexodontus* was breeding in seepage pools in a hollow under poplar trees. The water here was a small stream of drainage from melting snow. At Summit, Placer County, a few *hexodontus* pupæ were taken in a shallow pool in an open marsh with willow bushes. The water in these marshes is comparatively poor in organic matter as the pools are not enclosed and often have considerable current of water through them; but the ground over which they are formed must give a certain richness.

No form representing *hexodontus* was recognized in the collections made in the Kootenai region of British Columbia. This material was taken in 1903 and worked over by Mr. Coquillett at a time when the specific characters of *Aedes* were

¹Suture between the mesonotal prescutum and scutum.

not well understood. On going over the old material I find several specimens with pale golden, unbanded mesonotum, much as in one form of *hexodontus*. However, no determination can be made, as the mosquitoes of the Selkirks and Sierras are quite different, several eastern forms occurring in the former. Larvæ and males will have to be compared, which are not at hand in the Kaslo material.

Specimens before me, referable to *hexodontus*, have been taken as follows: Fallen Leaf Lake, Lake Tahoe, California, June 4 to 24, 1916 (H. G. Dyar); Tahoe Tavern, Lake Tahoe, California, June 20, 1915 (A. K. Fisher); Summit, Placer County, California, July 3 to 5, 1916 (H. G. Dyar); Gold Lake, Sierra County, California, alt. 6,582 feet, July 20, 1916 (H. G. Dyar); Gold Lake Camp, Plumas County, California, July 19 to 22, 1916 (H. G. Dyar); Hoquiam, Washington, May 27, 1904 (H. E. Burke).

***Aedes increpitus* Dyar.**

This species belongs to the *cantans* group, in which the adults often are indistinguishable by coloration, but the species separate easily by the male genitalia and larvæ. In the east there are three species, *stimulans* Walker, *fitchii* Felt & Young, and *abfitchii* Felt, the former breeding in river pools and having a short-tubed larva, the two latter breeding in woodland pools and having long-tubed larvæ. *Fitchii* and *abfitchii* have a tendency to a golden coloration of the mesonotum, especially on the shoulders; *stimulans* is grayer. There is also a species, *sansoni* Dyar & Knab, described from Banff, Alberta. Of this no larva is known; the male genitalia agree with *abfitchii*. Mr. Knab and myself associated as *sansoni* specimens from Kaslo, British Columbia, of which only females and larvæ are known; the larvæ agree with *abfitchii*. It is possible, however, that at both Banff and Kaslo there is more than one species of the *cantans* group. However, on the showing made, *sansoni* must be considered a synonym or a western form of *abfitchii*.

Another form, *vittata* Theobald, was described from Pecos Canyon, New Mexico. Males and females were taken, but the male genitalia have not been made known. A wrong larva

was associated. This name can only be identified by further collecting. It is probably not the same as *increpitus*, although the possibility is open.

The larva of *increpitus* has a short tube and frequents river valleys, like *stimulans*, but the genitalia differ. The color of the mesonotum is dark with gray scales at the angles, not yellow; but the character is not diagnostic.

In the Yosemite Valley, in May, I found *increpitus* in vast numbers. The larvæ were not only in the river pools, but occurred in woodland pools; everything in the valley was full of them. The adults were out and males were seen swarming. At Fallen Leaf Lake, the species was breeding in wave pools behind gravel beaches at the northern or outlet end of the lake, in artificial holes over a supply pipe, and in a grassy pool in a meadow close at hand. At Clio, in the Feather River valley, adults were still flying in July. I also got adults in August at Tahoe Tavern at Lake Tahoe. The water in these river and wave pools, frequented by this species, is dilute. The river pools often have a current, while the lake pools are connected by seepage with the lake itself. The larvæ come early, but are of slower development than the black-legged species, and can be found through June. Both males and females can be caught till late in the summer.

Specimens before me, referable to *increpitus*, have been taken as follows: Yosemite Valley, California, May 14 to June 13, 1916 (H. G. Dyar); Little Yosemite Valley, California, May 23 to 28, 1916 (H. G. Dyar); Fallen Leaf Lake, Lake Tahoe, California, May 28 to June 24, 1916 (H. G. Dyar); Tallac, Lake Tahoe, California, June 17, 1916 (H. G. Dyar); Glenbrook, Nevada, August 25, 1915 (H. G. Dyar); Tahoe Tavern, Lake Tahoe, California, June 20, 1915 (A. K. Fisher), August 15, 1915 (H. G. Dyar); Clio, Feather River, California, July 9 to 23, 1916 (H. G. Dyar); Pacific Grove, California, July 2, 1903 (Isabel McCracken); Eureka, California, May 6 to July 6, 1903 (H. S. Barber); Fieldbrook, California, May 26, 1903 (H. S. Barber).

The last three localities are in the coast region of California

and not the Sierras, and there is a possibility that there is a different species involved, no larvæ being known.

***Aedes palustris* Dyar.**

This species belongs to the *cantans* group, but it is distinguishable as adult by the large number of white scales on the wings which invade even the fifth vein. Normally, the abdomen is basally banded with white scales and a few apical white scales also; but a marked variety occurs in which there is a complete line of white scales down the back. I propose to designate this by the new name PRICEI, in honor of Mr. W. W. Price, the proprietor of Fallen Leaf Lodge, to whom I am indebted for many kindnesses. The variety *pricei* has a very marked appearance, quite strongly suggesting *nigromaculis* Ludlow, *riparius* Dyar & Knab, or *euedes* Howard, Dyar & Knab, but to which it is not allied. Type number for the variety *pricei*, No. 21043, U. S. Nat. Mus.

The larva has a long tube and lives in grassy marshes. These larvæ were in the marsh near Tallac referred to under *hexodontus*, and there Mr. Price assisted me to secure several. They were also in the meadow pool near the end of Fallen Leaf Lake referred to under *increpitus*. Several larvæ were found in the Little Yosemite Valley in a pool which was flooded with rain at the time but was apparently originally a grassy meadow pool. Adults were flying in the high mountains about Gold Lake, south of Clio. Here the species *palustris* and *increpitus* were separated, there being no river or wave pools about Gold Lake and only river pools at Clio. Elsewhere, at Yosemite and Fallen Leaf, the species flew together.

Specimens before me, referable to *palustris*, were taken as follows: Little Yosemite Valley, May 20 to June 2, 1916 (H. G. Dyar); Fallen Leaf Lake, Lake Tahoe, California, June 3 to 24, 1916 (H. G. Dyar); Lily Lake, Lake Tahoe, California, June 16, 1916 (H. G. Dyar); Gold Lake, Sierra County, California, July 20, 1916 (H. G. Dyar); Gold Lake Camp, Plumas County, California, July 19 to 21, 1916 (H. G. Dyar).

***Aedes vexans* Meigen (*sylvestris* Theobald).**

This widely spread mosquito occurred rarely in the Yose-

mite Valley. The species is distributed over Europe and North America, being indigenous to both continents. Along the Atlantic seaboard it is one of the commonest species, especially toward the north, breeding in temporary woodland and roadside pools. Of the Yosemite specimens, one was caught May 14, 1916, the other bred from a woodland pool May 22, 1916, where it was associated with the ubiquitous *increpitus*.

Aedes cinereus Meigen (*fuscus* Osten Sacken).

This species also is common to Europe and America and, in the east, breeds in temporary woodland pools. In Yosemite it was bred from valley pools with *increpitus* and at Fallen Leaf from wave pools with the same association. It is thus a river valley species in the west. Previous records of this species from California are lacking, the westernmost record being Kaslo, British Columbia.

The adult has the mesonotum golden brown with traces of two darker lines; abdominal bands narrow, but widening at the sides to form a white lateral line. The legs are without sprinkling of white scales; the male has short palpi.

Aedes cataphylla Dyar.

A very characteristic species, with the thoracic and abdominal marking of *increpitus*, but with wholly black tarsi. The wing scaling also is peculiar. The eggs are much thicker than those of any other species in the Sierras. The male, larvæ, and life history are unknown.

This is the second earliest species to appear on the wing. When I arrived at Fallen Leaf Lodge, May 25, 1916, no mosquitoes were flying except overwintering specimens of *Culiseta*. The first adult of the spring emergence was seen June 2, a specimen of *ventrovittis*. On June 4 *cataphylla* was out in numbers, mixed with a few *tahoënsis*, and they continued to be taken till June 24, when I made my last catch at the lake.

Specimens before me, referable to *cataphylla*, were taken as follows: Fallen Leaf Lake, Lake Tahoe, California, June 4 to 24, 1916 (H. G. Dyar); Lily Lake, Lake Tahoe, California, June 16, 1916 (H. G. Dyar); Glenbrook, Nevada, June 5, 1916 (H. G. Dyar).

Aedes varipalpus Coquillett.

This species breeds in water in holes in trees. It is spread throughout California, both along the coast and in the Sierras, extending up to Washington and British Columbia and into the Kootenai region—wherever there are trees to hold water. Oaks are the most useful trees in this respect though probably alders, willows, and sycamores will serve also. The conifers do not hold water. The species was abundant in Yosemite Valley in May, more abundant than I have ever seen it before.

Specimens before me from the Sierras, referable to *varipalpus*, have been taken as follows: El Portal, California, May 12, 1916 (H. G. Dyar); Yosemite, California, May 13 to 18, 1916 (H. G. Dyar); Tahoe Tavern, Lake Tahoe, California, August 15, 1915 (H. G. Dyar); Homewood, Lake Tahoe, California, August 29, 1915 (H. G. Dyar); Glenbrook, Nevada, August 25, 1915 (H. G. Dyar).

Aedes ventrovittis Dyar.

This species is very early, being the first of the snow-pool species on the wing. At Fallen Leaf, in 1916, which was a very late season, a specimen was taken on June 2. Two others were obtained June 15, after which nothing more was seen of the species. I arrived at Gold Lake July 19, but saw nothing of *ventrovittis* at that time. Prof. W. B. Herms, however, who preceded me at Gold Lake, took several specimens of this species on July 4, it being the only mosquito flying. Gold Lake is about 500 feet higher than Fallen Leaf and about 75 miles farther north; the season is consequently some three weeks later.

The adults resemble *hexodontus* in coloration, having golden yellow scaled mesonotum, but are much smaller. Also the presence of white scales on the wings and the ventral abdominal stripe distinguish them. The males and larvæ are unknown. It will require very early collecting to obtain the life history, and this presents some practical difficulty, as none of the mountain camps are open early enough for this work. They are generally piled up with snow banks and uninhabitable.

Aedes fisheri, new species.

Proboscis, palpi, and antennæ black. Integument black; head with sparse, narrow curved, bronzy brown scales on the vertex, small flat whitish ones on the sides; many erected forked black ones on the nape. Mesonotum with sparse, coarse, narrow curved, bronzy brown scales, becoming straw-yellow around the antescutellar space and over roots of wings; scales on pleura small, flat, whitish. Abdomen black scaled, with small irregular bands of white ones at the bases of the segments, narrowly cleft on the dorsal line, widening on the sides, but not covering over half of the segment; penultimate segment with lateral patches only, last segment wholly black. Venter black scaled, the last two segments wholly black; fourth segment with white scales at base, third largely white scaled on basal half. Legs black scaled, the femora whitish beneath; femora, tibiæ, and first tarsal joint sprinkled with whitish scales. Wing scales black, a few white ones at base of costa and roots of first and fifth veins; outstanding scales long, slender, black, uniform.

Six females, collected by Dr. A. K. Fisher of the U. S. Biological Survey, at Tahoe Tavern, at the outlet of Lake Tahoe, California, June 20, 1915.

Type, No. 21042, U. S. Nat. Mus.

This species is of the size of *cinereus* and *ventrovittis*. The male is unknown, but presumably has long palpi; the mesonotum is dark brown, not bronzy, and has no dark lines; there are white scales on the legs and the abdominal bands do not join in a white lateral line. These characters differentiate it from *cinereus*. It is closest to *ventrovittis*, but the mesonotum is uniformly dark brown, not golden yellow with more or less distinct paired brown lines; there are less white scales on the wings and the ventral black line of the abdomen is lacking. The species is of a different seasonal occurrence; *ventrovittis* is early, none being seen at Fallen Leaf after June 15 of 1916, a very late season. Dr. Fisher took *fisheri* at Tahoe Tavern, a more advanced locality than Fallen Leaf, and in 1915, a normally early season. It is probable that *fisheri* did not ap-

pear in 1916 until July, which may be the reason why I missed this species entirely, as I left the mountains before then.

Culiseta inornatus Williston.

This species is typical of the low country and strays only sparingly into the mountains. It is abundant in Nevada in the valleys at the foot of the mountains surrounding Lake Tahoe; specimens were taken in the mouth of Kingsbury Canyon. It was found breeding in muddy pools in a cow pasture near Glenbrook on the Nevada side of Lake Tahoe. This side has a more arid character than the California side, more resembling the sagebrush plains, with their irrigation pools, so favorable to *inornatus*.

Culiseta incidens Thomson.

Equally at home everywhere in the west, in the plains and mountains, breeding in any enclosed water from rain-barrels to mountain springs. Hibernated adults are the first mosquitoes seen in the spring, and breeding begins early. I found pupæ already in May, 1916, in the Yosemite Valley, while many *Aedes increpitus* were no further advanced. At Gold Lake the larvæ were in vast numbers in all stages, together with egg-boats, but many already in the last stage, in a marsh only recently vacated by *Aedes hexodontus*, on July 20, 1916.

The species breeds all summer. I found them in an ice-cold mountain spring at Fallen Leaf, in August, 1915, where they were preyed upon by *Eucorethra* larvæ. In May-June, 1916, they were again in the same spring, again preyed upon by *Eucorethra*.

Culiseta impatiens Walker.

This species was caught at Yosemite, Fallen Leaf, and Gold Lake. The enormous size of the adults is striking.

There is no previous record of this mosquito from California, though it has a northern distribution, from Alaska eastward to the mountains of northern New York. Its occurrence in the Sierras, therefore, was to be expected. The larvæ are known to inhabit cold spring pools and can be found all summer. The adults hibernate.

Culex tarsalis Coquillett.

This species is abundant throughout the west, especially in the lowlands, breeding in all kinds of permanent and semi-permanent pools, except open river-bed pools, taking readily to irrigation water. It occurs throughout the mountains, although in reduced numbers, favoring open warmer pools. Specimens were taken at Yosemite, Fallen Leaf, Lake Tahoe, and Gold Lake, in fact everywhere that I went. The eggs are laid in the usual boat-shaped masses and the adults are supposed to hibernate, although exact observations are lacking. On one occasion I collected recently dried sod from an irrigated pasture at Steamboat, Nevada, and, on immersing the sod in water, three *tarsalis* larvæ hatched. This would indicate that fragments of an egg-boat may exist on dry grass for a time. Whether or not there is normal habit shown here, I am unable to say.

Culex saxatilis Grossbeck (*territans* Auct. non Walk.)

This species is well known as an inhabitant of the Sierras, having been taken at Sisson, California, by Dyar and Caudell in 1906. Larvæ were collected by me in grassy pools near Tahoe Tavern, Lake Tahoe, in August, 1915, and adults were caught in the Yosemite Valley in May, 1916.

A NEW CTENACROSCELIS

(*Tipulidæ*, *Diptera*)

By CHARLES P. ALEXANDER¹

The crane-fly described below is one of the largest, if not the very largest, member of its family. The allied *Ctenacrosceles præpotens* Wiedemann (Aussereur. zweifl. Insekt., 1, 40, 41, 1828, as *Tipula*) has long been considered to be the giant of the family; but the wing of the female of *præpotens* barely attains a length of 40 mm., whereas the male of the new species measures at least as much; the females are larger than the

¹Contribution from the Entomological Laboratory of Cornell University.

males in this tribe of flies and this sex of the new species, at present unknown, must be an immense insect.

Ctenacroscelis rex, new species.

Size very large (wing of the male 40 mm. or over) ; thoracic stripes blackish.

Male.—Length, 33–35 mm.; wing, 40–43.5 mm. Foreleg, femora, 22 mm.; tibia, 23 mm.; metatarsus, 24 mm. Middle leg, femora, 24–25 mm.; tibia, 21–22 mm.; metatarsus, 25–26.5 mm. Hind leg, femora, 27.5 mm.; tibia, 30 mm.; metatarsus, 31.5 mm.

Frontal prolongation of the head moderately long, reddish-brown, the palpi dark brown. Antennæ short, brownish yellow, the outer face of the flagellar segments with numerous black hairs. Head dull yellowish brown with a narrow yellow line adjoining the eye.

Thoracic dorsum bright yellow with three grayish black stripes, the median one double, the lateral stripes abbreviated; scutum with a large double blackish mark on each lobe; scutellum and the median portion of the postnotum brown, sides of the segment dull yellow. Pleura dull light yellow, unmarked. Halteres slender, dark brown, the knob brighter. Legs with the coxæ and trochanters yellow; femora yellow, the tips somewhat darker; tibiæ brownish yellow, the tip indistinctly darker; tarsi brown. Wings very light brownish yellow to subhyaline, the costal cell a little brighter, a faint suffusion along the branches of *Cu*, the stigma indistinct.

Abdominal tergites dull yellow, the apical sclerites more brown. Hypopygium with the ninth tergite having the caudal margin gently concave, the apical third of the segment densely hairy, especially along the outer angles; outer lobe of the pleurite long and slender, the base broader, gradually narrowed toward the tip.

Holotype, ♂, Taungoo District, Burma.

Paratypes, 2 ♂, topotypic.

The type is in the collection of the American Entomological Society, Philadelphia. A paratype is in the collection of the author.

This species is closest to *Ctenacroscelis præpotens* Wiedemann but differs in the distinct blackish thoracic stripes and the lack of a distinct yellow stigmal spot on the wings.

A SYNOPTIC REVISION OF THE CUTEREBRIDÆ, WITH SYNONYMIC NOTES AND THE DE- SCRIPTION OF ONE NEW SPECIES

By CHARLES H. T. TOWNSEND

The present paper deals only with those species represented by adult material in the U. S. National Museum, totaling 108 specimens. A careful study of this material has disclosed many errors which need correction. Certain species of the older authors have been misidentified, certain valid species names have been put in the synonymy, certain synonyms have been used as valid names, and certain aberrant specimens of old species have been described as new species. These errors are corrected in the notes which follow the tables. The following synopses will serve to separate the species treated.

SUBFAMILIES AND GENERA

1. No facial carina; antennal pit large and deep; antennæ elongate.. 2
 Facial carina present; antennal pit small and shallow; antennæ
 short (CUTEREBRINÆ) 3
2. Epistoma rather broad, projected obliquely forward and down-
 ward between the peristomalia; arista thickly long-plumose to
 tip (PSEUDOGAMETINÆ) *Pseudogametes*
 Epistoma very narrow, projected straight downward between the
 peristomalia; arista with hairs on upper side only (DER-
 MATOBIINÆ) *Dermatobia*
3. Arista nude *Rogenhoferia* (no material seen)
 Arista with hairs on upper side and on apical part of lower side.. 4
4. Antennal pit extended below in a tapering prolongation, the
 peristomalia converging obliquely and meeting near the lower
 end of carina..... *Cuterebra*
 Antennal pit circumscribed below, subcircular, the peristomalia
 parallel and closely approximated to carina for about the lower
 half of its length..... *Bogeria*

SPECIES OF CUTEREBRA

1. Whole thorax and scutellum clothed with light-colored pile..... 2
Mesoscutum and scutellum clothed only with short black hairs.... 3
2. Thoracic and scutellar pile cinnamon-yellow, dense; anal segment
with only black hairs.....*cuniculi* Clk.
Thoracic and scutellar pile pale yellowish, rather thin; anal seg-
ment similarly pilose.....*analís* Mcq.
3. Parafacials and cheeks wholly or partly white-hairy..... 4
Parafacials and cheeks entirely black-hairy..... 5
4. Pleuræ with only black pile.....*approximata* Wlk.
Pleuræ with yellowish-gray pile.....*histrío* Coq.
5. Pleuræ with only black pile or at most traces of whitish..... 6
Pleuræ for the most part with whitish or yellowish pile,
americana Fab.
6. Anal segment shining like rest of abdomen.....*tenebrosa* Coq.
Anal segment more or less pollinose, leaving rounded shining areas. 7
7. Mesoscutum shining, without pruinosity.....*atrox* Clk.
Mesoscutum largely whitish-pruinose.....*maculosa* Knab

SPECIES OF BOGERIA

1. Mesoscutum with light-colored pile..... 2
Mesoscutum with only black hair..... 3
2. Anal segment shining, not pollinose but thinly clothed with light
hairs*emasculator* Fitch.
Anal segment densely yellowish or grayish pollinose and with light
hair*grisea* Coq.
3. Mesoscutum grayish pruinose, thinly clothed with short hairs..... 4
Mesoscutum not pruinose, the hair longer and pile-like..... 6
4. Hind edge of scutellum with thicker and longer hair than that of
mesoscutum 5
Hind edge of scutellum with only short hair.....*buccata* Fab.
5. Anal segment densely yellowish pollinose, clothed with yellow
hair*fontinella* Clk.
Anal segment with only thin pollen and black hair....*princeps* Aust.
6. Anal segment densely yellowish pollinose, with yellow hair,
fasciata Swenk
Anal segment thinly pollinose at most, with only black hair,
scudderi n. sp.

Pseudogametes semiatra Wied.—Specimens of this most striking form, from southern Brazil, sent by Dr. A. Lutz, show

on external characters that the genus certainly belongs in the Cuterebridæ.

Cuterebra cuniculi Clk.—I consider, with Brauer, that *horripilum* Clk. must be a synonym of this species. *C. abdominalis* Swenk is the same species.

Cuterebra americana Fab.—There are several forms of this species in the east and west. The mesoscutum may be quite highly polished or with a very thin but distinct pruinosity, while the pleural pile varies from whitish to distinctly yellow. I took 14 males of the pruinose form along the stream in Hell Canyon, Manzano Forest Reserve, New Mexico, at about 5,500 to 6,500 feet, September 14 and 17, 1916; and one male of the polished form on the Rio Ruidoso, Lincoln Forest Reserve, New Mexico, at about 7,000 feet, September 30, 1916. Many specimens of the pruinose form were taken by me in July, 1898, at the same point on the Rio Ruidoso, showing that both forms occur together in the same district. *Cuterebra nitida* Coq. is evidently a male of this species with an abnormally narrow front, while *latifrons* Coq. is evidently one with an abnormally wide front. *C. polita* Coq. is the same species, as is also the allotype (male) of *lepivora* Coq. Of the above, *polita* is the form with polished mesoscutum, while the others show some pruinosity. Specimens from Virginia, South Carolina, and Georgia show the mesoscutal pruinosity rather more distinctly and have the yellowest pleural pile.

Cuterebra approximata Wlk.—Two specimens from Yuma and Phoenix, Arizona, are somewhat doubtfully referred to this species.

Cuterebra atrox Clk.—From the description, *similis* Johns. is evidently this species.

Cuterebra histrio Coq.—The holotype is from Guanajuato, Mexico. Many specimens of a form of this species were taken by myself in the Sierra Madre of western Chihuahua near Meadow Valley, at about 7,000 feet. The facio-genal pattern is intricate and peculiar.

Bogeria princeps Aust.—*C. lepusculi* Towns, *lepivora* Coq. (holotype, female), and *albifrons* Swenk are evidently this

species. From the fact that the quite detailed generic and specific descriptions given by Austen fit the male of *lepusculi* exactly in every particular except the character of the arista, I was unable to repress the conviction that Austen's specimens had the arista denuded of hairs, especially since the very striking pile coloration described is known to me in no other form. I accordingly wrote to the British Museum for information, and now take the liberty of quoting here the reply kindly sent me by Dr. Guy A. K. Marshall: "I have examined Mr. Austen's type of *Bogeria princeps*, but, unfortunately, the head is in a dirty condition, and only one antenna is left. At first sight, the arista certainly does appear to be entirely bare, but, on examining it with a higher power, I find a portion of a hair on the basal half, and it seems to me extremely probable that the arista has really been denuded. In Mr. Austen's second specimen both the antennæ are gone, so that this does not throw any light on the matter." In the female the white pile of pleuræ does not follow around the edge of scutellum and is lacking on base of abdomen. Some males also lack this pile on base of abdomen, while others show it conspicuously developed. The species reaches Arizona, California, Nevada, and New Mexico, and attacks both the jack rabbit and the cottontail. The genus is valid on facial characters, as described and figured by Austen.

Bogeria emasculator Fitch.—This is a valid species and entirely distinct from *fontinella* Clk. It is a parasite of squirrels and chipmunks. *C. scutellaris* Br. is the same species. It appears to be restricted in range to the northeastern parts of North America.

Bogeria fasciata Swenk.—This species seems to replace *emasculator* in the west, and has the same habits. It was reared by me from a larva taken in July, 1898, from the fore leg of a *Tamias* sp., on the Rio Ruidoso, New Mexico, the fly issuing the following May. The first-stage larvæ of both this and the preceding species probably enter such part of the host as happens to be most convenient, penetrating the scrotum when offered and not by invariable habit. The headless specimen in the U. S. National Museum labeled "Fitch's type" and "C.

emasculator" was so labeled under a misapprehension, as proved by its entire disagreement with the description. It is simply a specimen that had been wrongly so determined by Fitch, after describing his species. It is *fasciata* Swenk. *C. fontinella* Austen (nec Clark), 1895, Ann. Mag. N. H., ser. 6, Vols. XV, XVI, is also this species. The location of Fitch's holotype of *emasculator* is unknown. It was probably sent to some correspondent. Little importance was attached to type specimens in this country in Fitch's day.

Bogeria fontinella Clk.—There are three specimens of this species in the collection, from South Carolina, Florida, and Mississippi. It is a larger species than either of the two preceding and decidedly broader, rather closely approaching *buccata* in both form and size and like it evidently confined to rabbits. It may be at once distinguished from the squirrel flies by the pronounced gray pruinosity of the mesoscutum. At first sight, it appears identical with *buccata*, though slightly undersized, but is at once known by its densely pollinose anal segment.

Bogeria grisea Coq.—This is a small northwestern form intermediate between *emasculator* and *fasciata*.

Bogeria scudderi, new species.

Length of body, 16 to 20 mm.; of wing, 14 to 16 mm.; width of thorax, 7 to 8 mm. Three males as follows, all reared from rabbits: Washington, D. C., fly issued March 4, 1895, larva collected by Mr. N. P. Scudder; Round Mountain, Texas, fly issued September 20, 1895, larva taken by Mr. F. G. Schaupp from leg of host; Beltsville, Maryland, larva collected by Mr. E. B. Marshall, November 24, 1911. (All det. Coqt. as *buccata* Fab.)

Differs from *buccata* F. as follows: Narrower in form. Male front very narrow. Mesoscutum and scutellum chocolate color, clothed with short blackish pile, interspersed with a few grayish hairs along transverse suture. Abdomen chestnut-brown, the disk of tergum metallic and following the hind borders of segments laterally. Wings less deeply infusate. Pollinose spots not apparent on front.

Holotype, No. 20953, U. S. Nat. Mus.

Named in honor of Mr. N. P. Scudder, of the National Museum Library, who collected the first specimen.

Through the kindness of Dr. B. H. Ransom, Chief of the Zoological Laboratory, Bureau of Animal Industry, U. S. Department of Agriculture, I have had the opportunity to examine two third-stage larvæ, taken from the throat of hogs, which I am able, by comparison with puparia, to identify as this species. The entire, strong, sharply-pointed, thorn-like spines of these larvæ are distinctive of the rabbit bots of this group. The material is as follows:

B. A. I. Parasite Coll. No. 15614.—One specimen in situ in larynx of hog, Blacksburg, Virginia, collected by N. S. Mayo, July 22, 1910. The larva had embedded itself longitudinally in the wall of the larynx, on one side, even with the vocal chords.

B. A. I. Par. Coll. No. 18026.—One specimen from "larynx or pharynx" of hog, Birchwood, Tennessee, collected by B. J. Amerson, July, 1915.

In the first case above, the larva was uninjured and had evidently reached its location through its own locomotory efforts, by working its way from the pharynx, mouth, or gullet. It is a question whether the hog in this case, in rooting among rabbit burrows, ingested the egg from which proceeded this larva; or whether it ate the rabbit host containing this larva in the third stage, without incapacitating the latter, which was saved from being swallowed by its sharp spines and was afterwards able to make its way into the larynx. In the second case above, the larva appeared to have been injured by the teeth of the hog, indicating that the latter had ingested it either free or in situ in the rabbit host, but was unable to swallow it by reason of its very sharp spines piercing the œsophageal or pharyngeal membranes.

SOME INTERESTING ORTHOPTERA FROM MEXICO

By A. N. CAUDELL

Among a small lot of Orthoptera recently sent in for determination by Mr. Roberto Müller from Presidio, Mexico, were

three species of some interest by reason of their rarity or not having them hitherto reported from that country. They are as follows:

Sagona ovata Brunn. One ♀. Described from Costa Rica and since reported from Guatemala. This specimen from Presidio is, I believe, the first record of its being found in Mexico.

Pyrgocorypha rogersi Sauss. & Pictet. One ♀. Described from Costa Rica and not before recorded from Mexico.

Encoptolophus herbaceus Bruner. One ♀. This handsome little grasshopper was described from central Mexico but has not been reported since. It was found in moderate numbers by its describer in fields about the outskirts of Mexico City.

SOME NEW AUSTRALIAN CHALCID-FLIES, MOSTLY OF THE FAMILY ENCYRTIDÆ

(Hymenoptera)

By A. A. GIRAULT

Genus COCCOPHAGUS Westwood

Coccophagus ashmeadi Girault, *perseus*, new variety.

Female.—In the analysis of the Australian species runs to *ashmeadi* from which it differs in that the club joints are subequal to funicle 3 and not longer as in *nigriventris*. The pronotum is very slightly dusky, if at all.

Two females (G. Compere).

Habitat, Swan River, West Australia.

Types, Cat. No. 20683, U. S. Nat. Mus.

Coccophagus emersoni, new species.

Female.—Length, 1 mm. Black, the wings hyaline, the scape and legs golden except proximal four-fifths of the hind coxa; the following parts orange: Head, except a line between the lateral ocelli and most of the occiput; scutum, except the cephalic fourth; parapsides, except a small spot cephalo-mesad a little cephalad of middle; and scutellum, except at base mesad (a small area). Stature of *triguttatus*. Most of propleurum

and a roundish area below the tegula, yellow. Club distinct but not much wider than the funicle; funicle 3 a little longer than wide, 1 nearly twice longer than wide; pedicel barely as long as funicle 3, subequal to club 2; all club joints wider than long. Flagellum (except the pedicel) longitudinally striate. Mandibles subtruncate, but three weak, obtuse teeth indicated.

Three females in the collection of the U. S. National Museum.

Habitat, Perth, West Australia.

Types, Cat. No. 20684, U. S. Nat. Mus., three females on tags with a slide bearing a head.

Coccophagus australiensis, new species.

Female.—Length, 1.25 mm. Agrees with the description of *lunulatus* Howard but the scutellum does not always bear the black area at apex and funicle 1 is a little longer than the pedicel; scutum and scutellum with rather dense, close, yellowish pubescence. The male, apparently, has no yellow on the body.

From four females in the U. S. National Museum (G. Compere, 766).

Habitat, Swan River, Australia.

Types, Cat. No. 20685, U. S. Nat. Mus., two females on tags.

Cotypes in the Queensland Museum, a female on a tag.

Here is another one of those puzzling species, so similar to a species of another region yet with slight differences and probably wholly distinct as to origin. The species is founded on the supposition that it is an aboriginal of Australia. Hence, if so, rooted in a stock wholly remote from that of *lunulatus*. Later I found that the Australian species differs in having the scutellum hairy.

Genus ABLERUS Howard

Ablerus emersoni, new species.

Female.—Length, 0.75 mm., excluding the ovipositor, which is extruded for a length equal to a fourth or more that of the abdomen and is white at tip (the valves, that is).

In the analysis of species runs to *poincarei*, differing in that the ovipositor valves are white at tip, the cross-stripe of the fore wing is obliqued a little disto-caudad and is from between the stigmal and marginal veins. Marginal fringes of the fore wing about a fourth of the greatest wing width. Funicles 1, 2, and 4 subequal. Fore and middle tibiæ white except just beneath the knee. Funicle and club wholly brown.

From five females in the U. S. National Museum (G. Compere).

Habitat, Perth, West Australia.

Types, Cat. No. 20686, U. S. Nat. Mus., the above specimens on a slide.

***Ablerus impunctatipennis*, new species.**

Female.—Length, 0.50 mm., excluding the ovipositor, which is extruded for a length equal to nearly a third that of the abdomen and the valves are white at tip.

In the analysis runs to group III but differs in having the fore wing entirely brown with the exception of a moderately large, round, hyaline spot on the stigmal vein and a smaller spot on the base of the marginal vein. Dark metallic green; apex of pedicel, funicle 4, knees and tips of tibiæ and the tarsi except the last joint, silvery white. Longest marginal cilia of the fore wing about a third of the greatest wing width. Caudal wings with sparse discal cilia. Funicles 1 and 2 subequal, each a half longer than wide, 3 short, 4 shorter and a little shorter than 1. A naked path nearly across fore wing from the hyaline stigmal spot, the cilia denser proximad of this. (Color of head not seen.)

Two females in the collections of the U. S. National Museum (G. Compere).

Habitat, Perth, West Australia.

Types, Cat. No. 20687, U. S. Nat. Mus., the above specimens on a slide.

***Ablerus marchali* (Howard).**

Erroneously recorded from Sydney from a male specimen which I have compared with the type.

Genus MARIETTA Motschulsky

Marietta maculatipes, new species.

Female.—Length, 0.60 mm. Orange yellow, the wings hyaline (or subhyaline at base), the legs silvery white, the tibiæ with two dusky bands (incomplete ventrad) equally distributed, the first at apex of basal third, the second at about base of distal third. Caudal margin of abdominal segments dusky. Fore wings with about nine lines of somewhat coarser discal cilia proximad of the hairless line and a small patch farther proximad. Funicle joints annular, subequal; club 1 a little longer than wide, not quite half the length of the club. Cephalic legs immaculate.

Male.—The same but the fore wings bear only about six lines of discal cilia proximad of the hairless line, the body is smaller and the antennæ only 4-jointed, the club long, *solid*, five times longer than wide, the funicle joint a little wider than long and rather closely united with the club.

From five males, six females (G. Compere).

Habitat, Perth, West Australia.

Types, Cat. No. 20688, U. S. Nat. Mus., four males, six females on a slide.

Marietta novicapillata, new species.

Female.—Similar to *capillata* but the distal infuscation of the fore wing, usually isolated in that species, is here extended proximad around the caudal and cephalic margins, on the latter more than halfway to the venation (still farther on the opposite margin). Thus, this area is connected with the broken oblique line from stigmal vein as well as with the two isolated marginal areas (one caudad, the other cephalad) and is considerably larger than in the other species.

From five females on a slide (G. Compere).

Habitat, Perth, West Australia.

Types, Cat. No. 20689, U. S. Nat. Mus., the fore described specimens.

Aphelinus: *perisoptroides*, *literatus* and *inexplicabilis* belong here, doubtless. The genus may be known by the pat-

terned wings but differs from *Aphelinus* essentially in secondary sexual characters only (see *maculatipes*, above).

***Eupelmus cerambycoboideus*, new species.**

Female.—Length, 4 mm., the ovipositor valves white, just tipping the abdomen. Dark metallic green, the legs red except the first and last coxæ, the forewings hyaline yet with a distinct rectangular (longer cephalo-caudad) fuscous marking from about the distal two-thirds of the postmarginal vein and extending halfway across the wing. Venation yellowish. Scape with a distinct foliaceous expansion ventrad which though rather great is not much convexed; pedicel about two and a half times longer than wide at apex, a little longer than funicle 2; funicle 1 slightly longer than wide, 2 and 3 longest, each about two and a half times longer than wide, 4 a little shorter, 8 wider than long. Caudal tibial spurs double, stout, unequal. Postmarginal vein much longer than the long stigmal. Lower face and occiput with short silvery pubescence, the antennæ inserted on a level with the lower end of the eyes. Body densely, finely scaly. Axillæ moderately widely separated. Raised mesal cephalic area of scutum distinct, extending beyond the middle (its apex being drawn out into a carina); the lateral ridges join across before distal margin. Abdomen eupelmiform but rather depressed, as long as the rest of the body, the second segment rather deeply excised at caudal margin mesad, the others hardly so. Frons moderately wide. Teeth of middle tarsi black.

One female taken by Albert Koebele, in the collections of the U. S. National Museum.

Habitat, Sydney, New South Wales.

Type, Cat. No. 20690, U. S. Nat. Mus., the female on a card, a fore wing, antenna, and caudal leg on a slide.

***Coccophoctonus dactylopii* Ashmead.**

The types are labeled Honolulu, Hawaii; and are not of Australia as has been recorded.

***Ænasiella australia*, new species.**

Female.—Length, 1.75 mm., the ovipositor not extruded.

Differs from the description of the genotype as follows: *The marginal vein is a half longer than wide*, about half the length of the postmarginal, the latter three-fourths the length of the stigmal; the legs are concolorous except the tarsi, knees narrowly, nearly the distal half of the first tibiæ, tips of hind tibiæ and the middle legs except lightly the middle of the femora broadly (washed) and a distinct cinctus on the tibia at proximal fourth; funicles 1-4 subequal, each slightly longer than wide. Otherwise the same. Scutum and scutellum with scattered punctures.

Male similar but the wings hyaline and the antennæ brown yellow, the club darker, the dorsal edge of the scape and the pedicel above, metallic. Pedicel hemispherical, small, the scape compressed; club ovate, not long, larger than any funicle joint; funicle 1 a half longer than wide, 6 much wider than long, 3 a little longer than wide. Clothing of antennæ minute, dense. The frons is broad (male).

Two males, many females, reared from a brachyscelid gall on gum (A. Koebele).

Habitat, Sydney, New South Wales.

Types, Cat. No. 20691, U. S. Nat. Mus., four females on tags plus a slide bearing a head of each sex and a female fore wing.

Anastatus thoreauini, new species.

Female.—Similar to *nonexcisus* Girault but the two eye-spots of the fore wing are larger, the knees, tips of tibiæ and the tarsi reddish brown while the thorax laterad is suffused with reddish.

One female, Toowoomba, Queensland (A. Koebele).

Type, Cat. No. 20692, U. S. Nat. Mus., the specimen on a tag; wings, antenna, and hind legs on a slide.

Anastatus saintpierrei, new species.

Female.—Length, 3 mm., excluding the ovipositor which is extruded for a length nearly equal to that of the abdomen. Like *bombax* but differs in that the ovipositor is much longer, the valves wholly brownish black, the hyaline stripe on the fore

wing is no longer than the first (complete) cross-stripe; and the mesal part of the scutum bears white pubescence which is scattered; also, the scutellum is plane (a variable character). The raised triangle (cephalad) of the scutum is half the length of that part and scaly, not wavy-lined like the scutellum. Pronotum reddish (not metallic).

Many females in the U. S. National Museum (G. Compere).
Habitat, Perth, West Australia.

Types, Cat. No. 20693, U. S. Nat. Mus., two females on a tag; an abdomen, antenna, and fore wing on a slide.

Anastatus borrowi, new name.

For *A. splendidus*, in Memoirs Queensland Museum, IV, p. 20, preoccupied.

Genus MESEUSANDALUM Girault

A synonym of *Eusandalum*. The parapsidal furrows are *complete*, very narrow, joining before the middle of the scutum (exceptional for the whole subfamily, *teste* North American and European specimens).

Leptomastix australia, new species.

Female.—Length, 1.50 mm. Dark metallic purple, the proximal joint of the middle tarsus white. Resembling closely *trifasciatus* but the fore wing pattern differs in that there are but two fasciæ, the first and second being joined rather narrowly along the caudal margin of the blade. Thus the following wing pattern: A hyaline, longer than wide and hairy stripe at base, a rather narrow fuscous stripe much narrower than the second fuscous stripe and joined to it as noted; a triangular hyaline, naked area of rather large size between fuscous stripes 1 and 2, its next longest side against the submarginal vein; a second fuscous stripe over thrice the length of the first, broadening caudad, including the hairless line and extending from distal submarginal, marginal and all of postmarginal veins; a rather narrow, curved naked hyaline stripe, its convexity proximad, its proximal margin tipping apex of postmarginal and stigmal veins; a third fuscous stripe, much longer than the second

and through the naked hyaline distal margin. Discal cilia from base to fuscous stripe 1 coarser than that distad. Marginal vein over twice longer than wide, subequal to the postmarginal, the stigmal a half shorter nearly. Axillæ separated by a very short carina. Hind tibial spurs double. Head longer than wide, lenticular, the cheeks a little over half the length of the eyes. Club a little longer than funicle 1 which is about twice the length of 6, thrice longer than wide. Pedicel about as long as funicle 6.

From one female captured by sweeping native trees in a park at Muswellbrook, New South Wales, October 26, 1914.

Type in the Queensland Museum, a female on a tag, the head, fore wing, and a hind leg on a slide.

Pleistodontes nigriventris (Girault).

Transferred from *Agaon*. The species, through an error, was twice described as new. First as an *Agaon*; it was then transferred, upon re-examination, to its proper genus and described again; the first description was not known then to have been published, I being at a distance and having requested its withdrawal.

Miscogaster australia, new species.

Female.—Length 1.20 mm. Dark metallic purple, the wings hyaline, the legs and venation yellowish brown except the coxæ and proximal two-thirds of cephalic femur. Coarsely, uniformly scaly, the propodeum, petiole, and segment 2 of abdomen subglabrous, rest of abdomen delicately scaly. Face glabrous, but crosslined between the clypeus (itself glabrous but with obscure punctures), ventral ends of the eyes and the antennæ; also the cheeks lined, the vertex scaly. Scutum with two irregular rows of thimble punctures across it between middle and cephalic margin, the deep parapsidal furrows, the base of the scutellum and the deep cross-groove before its apex, punctuate or foveolate. A row of long black setæ across the cephalic margin of the pronotum, the latter distinct, transverse, its cephalic margin acute. Propodeum with a long median carina and no others, foveolate at apex of neck and at cephalic mar-

gin between the spiracles, the latter small round, a little separated from the margin; no spiracular sulcus. Abdomen with the petiole wider than long; abdomen ovate, depressed, its second segment occupying somewhat over a third of the surface, its caudal margin a little convex. Marginal vein not twice the length of the long stigmal whose knob is not large; marginal vein much shorter than the submarginal (over a third shorter), the postmarginal intermediate in length between the marginal and stigmal. Head wider than long, truncate at apex but acute at each ventrolateral corner, the clypeus somewhat produced, truncate, nearly twice wider than long. Cheeks shorter than the eyes. Antennæ inserted a short distance from the clypeus, just below the ventral ends of the eyes, 11-jointed with two ring-joints, the short, obliquely truncate, enlarged club but 2-jointed. Antennæ clavate-capitate. First ring-joint very short. Pedicel subequal to funicle 1, which is a little longer than wide; 2 and following on short petioles and widening distad, 2 somewhat wider than long. Mandibles 4-dentate. Scutellum and scutum long. Maxillary palpi 5-jointed.

One female in the U. S. National Museum (A. Koebele).

Habitat, Australia.

Type, Cat. No. 20465, U. S. Nat. Mus., a female on a tag; head, caudal legs, and fore wing on a slide.

SYNONYMS

Pseudanusia Girault equals *Comperiella* Howard. The ovipositor is free.

Cheiloneuroides Girault equals *Diversinervis* Silvestri.

Allomphale Silvestri equals *Secodella* Girault.

Tancostigmoidella Girault equals *Prococcophagus* Silvestri.

Idarnomorpha Girault equals *Idarnes* Walker.

Spalangiomorpha Girault equals *Chaetospila* Westwood.

My descriptions are correct but in *Idarnomorpha* the fourth club-joint I think ought not to be counted a true joint.

BROMELICOLOUS ANOPHELES

(Diptera, Culicidæ)

BY HARRISON G. DYAR AND FREDERICK KNAB

In the American tropics the water held by the leaf-bases of Bromeliaceæ has been found to be the natural habitat of the larvæ of three species of Anopheles. These species are closely related and of characteristic appearance, thus forming a small natural group within the genus. A fourth species, hitherto undescribed and differing only in a few details, is at hand. While the larval habits of this fourth species have not been definitely established, its close resemblance to the others, and the fact that it occurs in forested regions, warrant the conclusion that its larvæ occur in water-bearing bromeliads.

The species under consideration may be separated as follows:

1. Wing with four white spots involving costa and first vein..... 2
Only the two outer spots involving the costa.....*neivai* H. D. & K.
2. Third vein broadly white in the middle..... 3
Third vein black, a minute white spot at base.....*hylephilus* n. sp.
3. Hind tarsi with the last four joints white and with black rings at their bases*boliviensis* Theob.
Hind tarsi with the first four joints black, apically ringed with white, the fifth wholly black.....*bellator* D. & K.

Anopheles hylephilus, new species.

Female.—Proboscis slender, uniform, black-scaled. Palpi as long as the proboscis, uniform, black-scaled, the scales roughened toward base, a minute spot at base of last joint and the tip white. Occiput blackish gray, densely clothed with erect, broadly ovate black scales, some narrower whitish ones in front, a tuft of white hair-scales projecting between the eyes.

Mesonotum elongate, pale gray pruinose, medianly with two narrow, straight, impressed black stripes, obsolete on posterior third; close to lateral margins a pair of broader black stripes, attenuated at both ends, narrowly interrupted beyond the middle by an oblique gray line; disk with scattered pale hairs, anterior and lateral margins with a border of fine whitish scales. Scutellum narrow, collar-like, gray-brown, with dark marginal

bristles. Postnotum nude, brown. Pleuræ blackish brown, with a transverse stripe and the lower portion whitish pruinose; coxæ pale.

Abdomen depressed, dull black, without scales, clothed with rather coarse black hairs, posteriorly denser at the sides and with pale luster.

Wings hyaline, the veins marked black and white, the outstanding scales very narrow; four large white costal spots involving costa and first vein, the second spot at about middle of wing, the fourth a short distance before apex; a large white spot on the fringe at wing-apex at ends of second and third veins; a white spot on the fringe at apex of lower branch of fourth vein, another at apex of upper branch of fifth; a minute white spot at base of third vein, another at furcation of fifth; basal portion of first vein with a long interrupted white streak, separated from first costal spot by a small black spot. Halteres with white stems and black knobs.

Legs long and slender, black marked with white. Femora streaked with white, the hind pair with a black ring close to base; tibiæ white beneath to near apices, the extreme apices white; front tarsi with the first three joints dorsally streaked with white, the first with black ring near base, the second and third with black basal rings, the last two joints wholly dark; mid tarsi with the four proximal joints dorsally streaked with white to near base, the first with black ring toward base, the fifth wholly dark; hind tarsi with the first joint ventrally streaked with white, a black ring near base and a broad white one at apex, the four distal joints white and with basal black rings.

Length: Body about 3 mm., wing 3 mm.

Manoa, Orinoco River, Venezuela, January 10, 1910, one female (F. L. de Verteuil); Guayaquil, Ecuador, one female (F. Campos Ribadeneira); Gatun, Canal Zone, Panama, February, 1917, one female (L. H. Dunn).

Type, Cat. No. 21065, U. S. Nat. Mus.

Resembles *Anopheles boliviensis* most closely, but is readily distinguishable by the black-scaled third vein. In some specimens of *boliviensis* the third vein is dusky, but in such cases

the black spots at the ends of the vein are always differentiated. The mid tarsi of *boliviensis* have the three outer joints wholly dark and there are other less obvious differences in the leg-ornamentation.

Anopheles boliviensis (Theob).

Anopheles lutzii Theobald (not Cruz), Mon. Culic., vol. 1, p. 177 (1901).

Laverania lutzii Theobald, Journ. Trop. Med., vol. 5, p. 183 (1902).

Kerteszia boliviensis Theobald, Ann. Mus. Nat. Hung., vol. 3, p. 66 (1905).

Anopheles boliviensis Knab, Ins. Insc. Menstr., vol. 1, p. 17 (1913).

Anopheles boliviensis Knab, Rept. 1st Exped. to So. Amer., Harvard Sch. Trop. Med., p. 216 (1915).

This species ranges through the moist forest zone of South America, from the state of São Paulo northward, westward to the slopes of the Bolivian and Peruvian Andes. Further bibliographic references and a discussion of the synonymy will be found in volume 1, page 17, of this periodical.

Anopheles neivai Howard, Dyar & Knab.

Anopheles neivai Howard, Dyar & Knab, Mosq. No. & Centr. Amer. & W. Ind., vol. 4, p. 986 (1917).

Definitely known to occur in Panama and Costa Rica. Larvæ found inhabiting water held by bromeliads in southern Mexico (Córdoba) may be referred to this species without much doubt.

At this writing, the volume above referred to has not left the press, but the species is established by the figure of the wing published in a preceding volume (l. c., vol. 2, pl. 41, fig. 8, 1913).

Anopheles bellator D. & K.

Anopheles bellator Dyar & Knab, Proc. Biol. Soc. Wash., vol. 19, p. 160 (1906).

Anopheles bellator Howard, Dyar & Knab, Mosq. No. & Centr. Amer. & W. Ind., vol. 4, p. 985 (1917).

So far, this species is known only from the island of Trinidad, but undoubtedly will be found to occur on the adjacent mainland.

THE BARNES & McDUNNOUGH "LIST"

(Lepidoptera)

By HARRISON G. DYAR

The gentlemen from Illinois have published again. For persons already under criticism, this is nothing short of an "overt act," and the temptation is strong once more to obtain their *Capræ hirci*. However, this time I will temper my wind to the shorn lambs.

The title is "Check List of the Lepidoptera of Boreal America," which is distinctly misleading. Far more than the boreal region of America is included, the limits being the southern political border of the United States, excluding Porto Rico, the Virgin Islands, and the Canal Zone. But an element even of the tropical fauna is included in southern Florida and Texas.

A list like this, without references, is useful inversely in proportion to the attainments of the student. This list, therefore, will be of especial value to beginners and amateurs. Yet it contains the result of much labor of a highly critical order in the determination of synonymy and deserves serious consideration.

The list is founded upon my work in Bulletin 52, U. S. National Museum, yet any mention of that fact is carefully omitted. This is doubtless intended as the frost which killeth, and perhaps I shall not survive. We will see. I presume the authors have an alibi ready and will say that they follow the list of John B. Smith, not mine. How much of Smith's list was cribbed from my catalogue, the dispassionate may decide. I will not leave the decision to Barnes & McDunnough.

The sequence of families need not be commented upon; it is unobjectionable. The Nolidæ are transferred from the "Micros" to the Arctiidæ, following Hampson. I do not think this is their proper position, although I appreciate the arguments in favor of it.

Hübner's "Tentamen" is discarded as "unpublished." I think this is an error. The Tentamen was printed and distributed and was presumably obtainable from Hübner himself while his edition lasted. I do not know what more is necessary

to constitute publication. If the Tentamen was not published, neither is the "List" we are now noticing published, nor are Barnes & McDunnough's "Contributions" published. These things are printed, distributed and obtainable from the authors, while the edition lasts. I do not know the size of the edition authorized by the patronage of Miss Jessie D. Gillette; I do not know the size of Hübner's edition of the Tentamen. I apprehend that the point is unessential. The fact that a majority of European writers have discarded the Tentamen does not prove, to my mind, that the Tentamen should be discarded. The majority is not always right, nor is an appeal to the majority always in order.

An attempt has been made, in the Noctuidæ, to restore the generic names on the basis of the old determinations of types, instead of the "first species" method arbitrarily used by Hampson. While I have personally favored this method, I did so only in case it was officially adopted, which will probably never be the case. We must abide by the rules of nomenclature already established and, therefore, I think that this effort of Barnes & McDunnough is highly to be commended. To correct Hampson throughout will be a very difficult matter, dealing, as he does, with the world fauna.

A few matters of detail that strike the eye may be noted. To criticise exhaustively, the list must be gone over name by name, a matter for which I do not consider the expenditure of time commensurate with the anticipated results.

No. 45. *A. caliente* Wright is lettered as a variety, but printed in synonymic type. Which is intended?

No. 790. *H. burnsi* Watson should be listed as *a* of 789. See my recent note (Ins. Insc. Mens., iv. 131, 1916).

No. 781. *Thauma socialis* Feisth. should be marked as doubtfully North American; its home is in Chili. There is no recent confirmation of its reported occurrence in British Columbia.

No. 796. The determination should be revised. I do not think the form of *Hylesia* occurring in Arizona is *alinda* Druce. Unfortunately, I have no specimens at the moment.

No. 1028. *Platyprèpia* does not belong to the Arctiidæ. Its family is Hypsidæ, which is the same as Pericopidæ as here used.

No. 2751. *Deva ornata* Ottol., for which I created the genus *Rodriguesia*, is made a synonym of *Chalcopasta howardi* Hy. Edw., on the bold assumption that the type has a substituted head, as explained by Barnes & McDunnough in a recent issue of the "Contributions." I have examined this head. It is too large; the vestiture is not quite consonant with the mesothorax; the antennæ are as bizarre for the genus as are the palpi and front; the type came from Dr. Ottolengui and was prepared by Mr. Jacob Doll, a notoriously clever patcher of specimens. Therefore I accept this synonymy, at least pending the receipt of further material.

No. 2754. *N. sagittalba* Ottol. should be resurrected from the synonymy and listed as a good species as 2754, 1. It is larger than *poetica* and the costal stripe distinctly different.

No. 2756. *N. pendula* Ottol. should be "a," not a strict synonym; it may even be a distinct species. Judgment is difficult, as material in this genus is distressingly scant.

No. 3220. The subfamily beginning here is called Plusiinae instead of Hampson's unfamiliar Phytometrinæ.

No. 3228. The subfamily name Erebinæ is adopted to replace Hampson's Noctuinae.

No. 3360. This is a synonym of *A. repugnans* Hübner (see Proc. U. S. Nat. Mus., 47, 425, 1914).

No. 2804. This species is called *fimbriago* Stephens, a name not found in Hampson or Staudinger. Whether it is earlier or later than *xanthindyma* Boisduval, I cannot say without studying over Stephens' works and repeating the labor already performed by Dr. McDunnough. Original synonymy like this should not be given in a list where all references are omitted. *Xanthindyma* plainly applies to this form, as Boisduval says in his original description of *Cosmophila*: "Antennes légèrement pectinées dans les mâles" (Faun. ent. Mad., 94, 1833). Barnes & McDunnough, in a highly excited paper (Cont. Nat. Hist. Lep. N. A., ii, No. 5, 1914), tried to show otherwise and frantically quoted Hampson. I never paid any attention to this

paper, as it was obviously executed with a personal animus and the slurs and derogatory remarks at my expense show that any statements it might contain with reference to species described or synonymy established by me would have to be taken with a grain of salt. In this case, if *fimbriago* Stephens is older than *xanthindyma* Boisd., no harm has been done; if the reverse is the case, my forbearance has resulted in the perpetuation of an error.

No. 3464. This is called *latipalpus* Walk., which synonymy was unnoticed by Schaus (Proc. U. S. Nat. Mus., 50, 373, 1916). This is presumably *Hydrelia latipalpus* Walk. (Cat. Brit. Mus., xv, 1763, 1858) described from an unknown locality. This synonymy should have been specifically published.

No. 3726. *Apatelodes* is referred to the Eupterotidæ without question. I think this action is somewhat premature.

No. 4982. *Hellula phidealis* Walker might properly be added, as it occurs in the south. Localities before me are: Key West, Florida (Nat. Mus. coll.); Miami, Florida (Schaus coll.); Everglade, Florida, April 10, 1912 (J. A. Grossbeck); Brownsville, Texas, May 17, 1904 (H. S. Barber); Augusta, Georgia, October 17, 1898 (U. S. Dept. Agric.).

No. 5009. This synonymy is too sweeping. *S. singhalis* Walker, from Venezuela and the tropical mainland generally, is distinct from *huronalis* Guen. (*serinalis* Walk.) from North America and the Greater Antilles. (See Proc. U. S. Nat. Mus., 38, 272, 1910.)

No. 5307. This species is a synonym of *holophæalis* Hampson. In pointing this out (Ins. Ins. Mens., i, 105, 1913), I could not find the reference to Hampson's description. It will be found, however, under date of 1904 (Ann. Mag. Nat. Hist., (7), xiv, 181, 1904).

No. 5455. This is synonymous with *Corcyra cephalonica* Stainton, as pointed out to me by Mr. August Busck. Dr. Chittenden sent me only dwarfed specimens for determination in which venation was reduced, although he had normal large ones in his possession. I therefore feel more like blaming Dr. Chittenden than myself for the synonymy, although not wishing to make a scapegoat of anybody.

THREE NEW NORTH AMERICAN PHYCITINÆ

(Lepidoptera, Pyralidæ)

By HARRISON G. DYAR

Immyrla pasadamia,⁴ new species.

Head and thorax dark brown; abdomen brown with whitish segmental apical pale bands; anal segment dull ochereous. Fore wing dark brown, dark gray narrowly across cell; three whitish lines; the subbasal a little diffused and not strongly attaining costa, followed by raised black and white scales; inner line oblique above, erect below, a little wavy-denticulate; discal spots black, conjoined; outer line irregular, wavy-denticulate, indented opposite cell; a terminal row of black spots, preceded by a gray dilution. Hind wing fuscous, lighter in anal area; fringe pale, interlined. Expanse, 21 mm.

Type, male, No. 21056, U. S. Nat. Mus.; St. Johns, Quebec, June 18, 1911 (W. Chagnon); Dublin, New Hampshire (A. Busck); Hazleton, Pennsylvania (?), bred from *Betula*, June 18, 1902 (Dr. W. G. Dietz).

Salebria heinrichalis,⁴ new species.

Head and thorax dark gray, tuft of maxillary palpi dark ocher; thorax touched behind with dark blood-red. Fore wing dark gray; the inner line whitish, diffused, oblique; basal space filled with dark blood-red on its lower half, cut by an oblique black line, the costal area nearly black; discal dots small, joined by a fine line, followed by whitish scales; a blackish shade along costa in median space, deepest just beyond the inner line; a faint fine black line from inner margin at end of inner line to outer line at discal fold; outer line fine, white, denticulate, ex-curved over cell and indented at vein 1, followed by blackish costally; a terminal row of black dots. Hind wing gray, the veins darker; fringe paler, interlined. Expanse, 17 mm.

Type, male, No. 21057, U. S. Nat. Mus.; Falls Church, Virginia, reared from larvæ on *Quercus minor*, April 26, 1915 (C. Heinrich) (Hopk. U. S. 12,155h).

The larva is light yellowish with a subdorsal row of large black segmental patches; head pale, checkered with brown, with two pairs of black spots in front and one over the eyes;

thoracic shield flesh-color, with brown freckles and lateral black patch. Tubercles small, black, but with enlarged pale bases. The coloration is very peculiar for a Phycitid larva.

✓ **Eurythmia thurberiae**,¹ new species.

Fore wing stone-gray, the basal area broadly clear; inner line black, upright, straight; median area a little blackish shaded; discal dots conjoined; outer line pale, black-edged on both sides, the inner edging strong, the line near the margin; a powdery blackish terminal line. Hind wing whitish translucent with gray terminal line. Expanse, 11 mm.

Type, male, No. 21059, U. S. Nat. Mus.; Bowie, Arizona, March, 1914, reared from larvæ on *Thurberia* (H. S. Barber).

A NEW PHYCITID FROM THE BAHAMAS

(*Lepidoptera, Pyralidæ*)

By HARRISON G. DYAR

Anegcephalesis, new genus.

Hind wing with 8 veins, the fore wing with 11; hind wing with median nervure bifid; labial palpi upturned, erect, sharp and slender; vein 2 of hind wing arising well before the angle of the cell, the cross-vein not opposite vein 3, but prolonged parallel to the median vein; veins 3 and 5 not stalked, the cell rather short, veins long; maxillary palpi of male flattened, scaly, appressed to the front, which is strongly hollowed to receive them, and covered by the grooved labial palpi; fore wing with a line of raised scales before the first line; antennæ of male with a bend at base filled by a large tuft of long brown scales, ciliate, subserrate; of female, simple.

Anegcephalesis cathæretes, new species.

Male.—Head and collar dark gray, patagia lighter; antennal tuft black. Fore wing elongate, narrow, gray; basal space dark, with a few black scales along submedian fold, bounded outwardly by a line of erect black scales, which does not attain costa or margin; this line is followed by a dull ochreous space, bordered outwardly by the inner line; inner line

whitish, edged by black without, erect to median vein, then oblique inwardly to costa; discal dots conjoined into a bar, followed by irregular black scaling on the bases of the discal nervures and by orange or black scales below in the submedian space; outer line whitish, edged by black on both sides, more diffusely outwardly, finely denticulate and sharply incised opposite cell; a black terminal line; fringe pale gray at the base, darker outwardly. Beneath, a long pencil of pale yellowish hairs concealed in a fold along submedian space. Hind wing whitish, translucent, gray along costa; a dark gray terminal line; fringe interlined with gray. Expanse, 20 mm.

Female.—Similar, but with less contrasting shades, uniform gray, the lines black, the yellowish shades usually converted into gray, though occasionally distinct. Expanse, 20–21 mm.

Type, male, No. 21058, U. S. Nat. Mus., selected from 26 males and 35 females, bred from larvæ in large, conspicuous, unsightly nests on a bush growing rather commonly in the wild country, New Providence Island, Bahamas, February and March, 1915 (H. G. Dyar).

The larva is brown with faint longitudinal stripes, a broad subdorsal one being distinct. Tubercle iib on joint 3 and iii on joint 12 are much enlarged.

A detailed description of the setal pattern is appended, prepared by Mr. Carl Heinrich, who has lately made a special study of the matter.

The samples which I preserved of the food plant for determination have been lost or mislaid, so its name cannot be stated at this writing. A native of the island called it "wild cassava."

This Phycitid occurs also in Cuba. I have 3 males and 16 females taken by Mr. Wm. Schaus at Santiago, in June, July, August and October, 1902. The male is more darkly shaded than in the form from the Bahamas, the dark markings extended, reducing the gray ground to one or two patches. The female seems a little brighter than the Bahamas form, the ochreous shade before the inner line being always distinct; but there is no constant difference.

GENERIC DESCRIPTION OF LARVA OF ANEG-
CEPHALESIS DYAR(Type *A. cathæretes* Dyar)(*Lepidoptera, Pyralidæ*)

By CARL HEINRICH

Head capsule spherical, nearly square in outline viewed from above, slightly wider than long; greatest width back of middle of head; incision of dorsal hind margin about one-sixth the width of head; distance between dorsal extremities of hind margin a little more than one-third the width of head. Frons (FR) pentagonal, nearly as wide as long, not reaching to middle of head; adfrontal ridges (ADFR) parallel from lower limit of epistomal area to point of juncture of tentorial arms, thence converging in straight lines to the longitudinal ridge (LR) which is slightly longer than frons; adfrontal sutures (ADFS) meeting longitudinal ridges well before incision of dorsal hind margin. Projection of the dorsal margin over ventral a little more than half the diameter of the head. Triangular plates of hypostoma nearly equilateral, well separated by transparent gula, opposing extremities rounded.

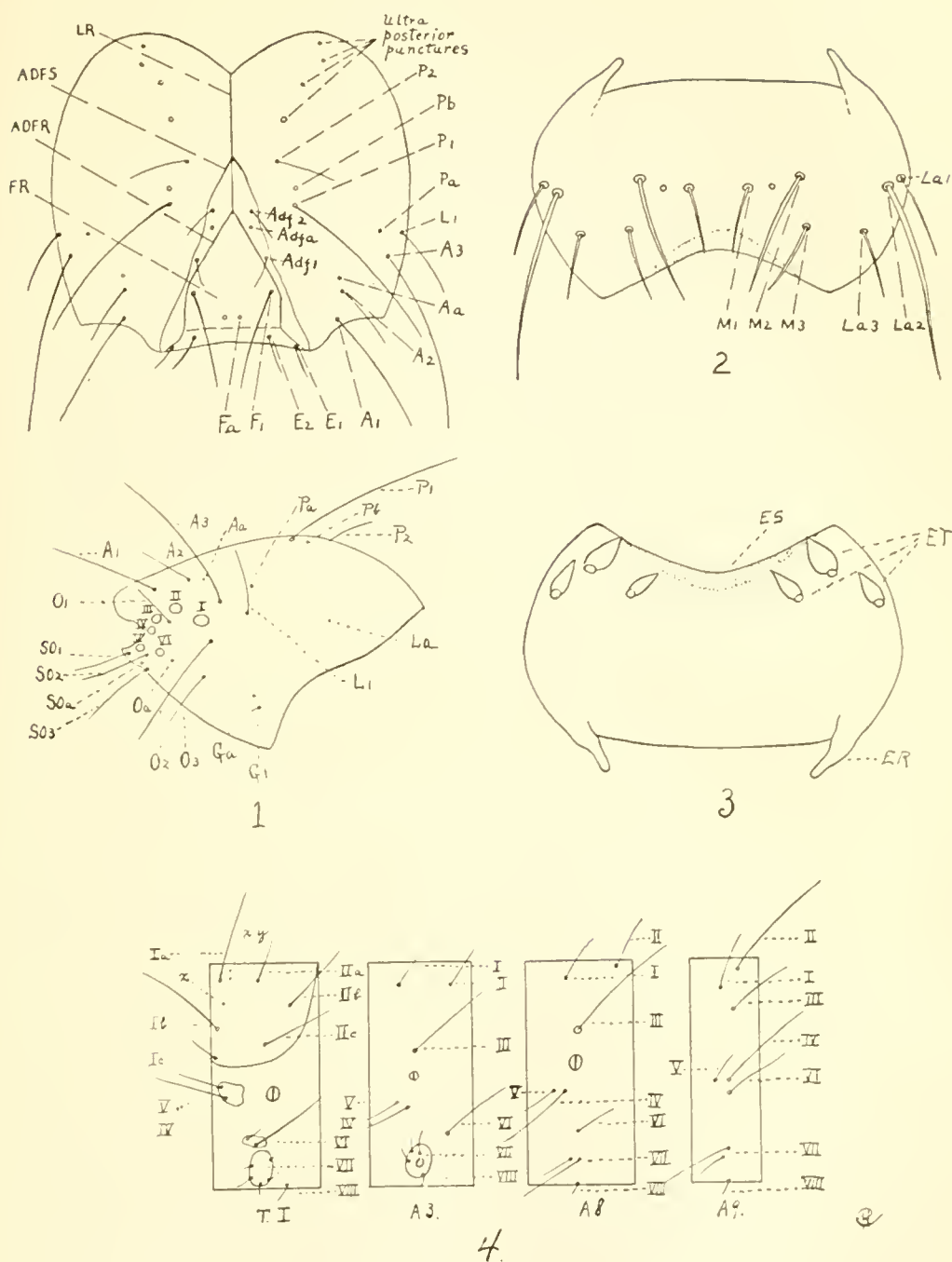
Ocelli six, with III, IV, V in a straight line; I larger than the others; III and IV closer together than any of the others.

Epistoma with the usual two pair of setæ (E1, E2) well developed.

Frontal punctures (Fa) close together, anterior to frontal setæ (F1); distance between punctures less than distance from puncture (Fa) to seta (F1); distance from frontal seta (F1) to seta Adf1 less than from Adf1 to Adf2; second adfrontal seta (Adf2) on a level with beginning of longitudinal ridge (LR); adfrontal puncture (Adfa) approximate to seta Adf2.

Epicranium with the normal number of primary setæ (13) and punctures (7) and with four minute ultra posterior punctures. Anterior setæ ¹ (A1, A2, A3) in an obtuse angle; A1 and A2 closer together than A2 and A3; anterior puncture (Aa) posterior of A2. Setæ (P1, P2) and puncture (Pb) of

¹The nomenclature for head setæ is, with some improvements suggested by Mr. August Busck, that proposed in Proc. Ent. Soc., VIII, 3, 1916, pp. 154-164.



EXPLANATION OF PLATE I

FIG. 1. Top and side view of head capsule showing setal arrangement.

FIG. 2. Labrum.

FIG. 3. Epipharynx.

FIG. 4. Setal maps of first thoracic and third, eighth, and ninth abdominal segments.

posterior group at middle of head; P1 nearly on a level with Adf2; P2 on a level with place of juncture of adfrontal suture with longitudinal ridge; A1, P1, and P2 in a straight line; puncture (Pa) approximate to and equidistant from A3 and L1; Pb directly posterior to P1. Lateral seta (L1) closely approximate to A3, on a level with Adfa; lateral puncture (La) directly posterior to the seta, remote. Ocellar setæ (O1, O2, O3) well separated; O1 equidistant from ventrad to ocelli II and III; O2 postero ventral and approximate to ocellus I; O3 remote from and directly ventrad to O2; puncture Oa between O3 and ocellus VI, approximate to the latter. Subocellar setæ (SO1, SO2, SO3) triangularly placed; SO3 slightly nearer to SO2 than to SO1; puncture SOa almost on a line between SO1 and SO3.

Labrum with median incision broadly concaved, rather shallow; seta M2 laterad and very slightly back of M1, equidistant from M1 and M3; M3 almost directly forward of M2, well back of anterior edge of labrum; La2 on a line with M1, near lateral edge; La1 closely approximate and almost directly laterad to La2; La3 on a level with M3; distance separating La3 equals that between La3 and M3, M3 and M2, and M2 and M1; puncture directly lateral to M1, equidistant from M1 and M2.

Epipharyngeal shield (ES) a narrow border of chitin along the median incision of the labrum. *Epipharyngeal setæ* (ET) triangularly placed near anterior margin of epipharynx, short, moderately broad, equidistant. *Epipharyngeal rods* (ER) indicated by their posterior projections only; these are moderately long.

Mandibles rather stout, about as broad as long; three toothed; the lowest tooth small and compressed; two stout setæ on the lower side.

Antenna four jointed; moderately long and slender joint ii as long as joints i, iii, and iv combined, longer seta extending well beyond extremity of antenna, about as long as the four combined joints, shorter well back of longer seta, papillæ nearly as long as joint iii; joint iii longer than broad and much longer than joint iv.

Labium and *Maxillæ* normal.

Maxillulæ with well developed, spined lobes.

*Body setæ*² normal; prothoracic iib as far caudad of iia as iia is of ia, ia and iia on a level, ib and ic closer together than either of them are to iic, iv almost directly under V, punctures X and Y closely approximate to setæ ia, x dorsal of y and y caudad of ia, Z almost directly dorsal of ib; on third abdominal segment i and ii are on a line, iii directly over the spiracle, iia absent, iv caudad to and very slightly lower than v, iv directly in line with iii and the spiracle, group vii triangularly placed; abdominal segment 8 has ii slightly higher than i, and setæ ii closer together than on any of the other segments, iii directly over spiracle, iv directly caudad of v, vi on a line with spiracle and iii, vii bisetose; abdominal segment 9 with i, ii, and iii triangularly grouped and nearly equidistant, iv, v, and vi closely approximate to each other, iv directly caudad of v, and vi under iv, vii bisetose.

Crochets of abdominal prolegs in a complete circle, triordinal, smallest crochets not more than one-fourth as long as longest.

Spiracles circular in outline; those on prothoraciæ and eighth abdominal segments not more than twice the size of the others.

The tubercles of seta iib on the mesothorax and of iii on the eighth abdominal segment are larger than any of the others on the body and more heavily chitinized. This, however, is very possibly a specific character.

A NEW NOCTUID FROM BRAZIL

(*Lepidoptera, Noctuidæ, Acronyctinæ*)

By HARRISON G. DYAR

Oxythaphora, new genus.

Fore wing with veins 2 and 3 from the cell, 4 and 5 shortly stalked, 6 from the apex of the cell, 7 to 10 stalked, no areole, 11 on the cell. Hind wing with vein 2 from the cell, 3 and 4

²The Dyar system of numbering is applied without prejudice to all body setæ as the most convenient and practical for systematic purposes. No homology between thoracic and abdominal setæ is attempted.

from the lower angle, 5 from the middle of the cross-vein, weak, 6 and 7 long-stalked, 8 very close to the cell to the middle. Frons with a large prominence with raised edges; tongue rudimentary; palpi short, porrect, not reaching the frons; tibiæ unarmed; eyes naked; vestiture of hair and hair-like scales.

Oxythaphora delta, new species.

Front yellow; vertex brown above the prominence, yellow and white behind; collar yellow and white, thorax gray, abdomen dark yellow above and on last two segments below, base of venter blue-gray; legs and venter of thorax gray. Fore wing bluish white on costal half, slate-gray below median vein; a broad gray band across middle, edged with black on each side, strongly contracted in the cell; veins 8 to 11, black lined toward apex and a streak on veins 7, 6, and 5, succeeding below; veins 3 to 5 outwardly narrowly black.

Hind wing blackish, marked with gray in the cell and at base of anal margin. Expanse, 40 mm.

Type, male, No. 21051, U. S. Nat. Mus.; Natal, Brazil, January 22, 1917 (E. C. Green).

Date of publication, April 6, 1917.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar and
Frederick Knab. Price, \$2 a year in advance.

Subscriptions and matter for publication should be addressed to Harrison
G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the
manuscript.

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INSECUTOR INSCITIZÆ MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. V

APRIL-JUNE, 1917

Nos. 4-6

Insecutor Inscitiae Menstruus

Vol. V.

APRIL-JUNE, 1917

Nos. 4-6

AN ANNOTATED LIST OF THE THYSANOPTERA OF PLUMMER'S ISLAND, MARYLAND

By J. DOUGLAS HOOD

Nine miles above the city of Washington, in the Potomac River, is the home of the Washington Biologists' Field Club, a little island of 12 acres known as Winnemana or Plummer's Island. From the lodge, 75 feet above the water, it slopes precipitously on the south to the edge of the Potomac; on the north and east to a low, forested flood-plain; while toward the west it is more irregular in contour, with typical upland hardwoods, scattered pines and junipers, and isolated rocky patches overgrown with such plants as *Opuntia* and poison ivy. Charming and convenient of access, it has become a favorite collecting spot for local entomologists, and in the scientific literature of the last decade there have been recorded from these 12 woodland acres more than 100 new insects, for whose reception have been erected 13 new genera and 2 new families.

The Thysanoptera, however, received no attention until January, 1912, when, through the kindness of Mr. W. L. McAtee, the author made his first visit to the island. Since that date many hundreds of specimens have been taken, until at present 57 species are known from the island itself, in addition to several unidentified uniques not here listed. Seventeen additional species have been taken within a few miles of the island—some, indeed, within a few yards. All of the latter probably occur here while several others, at present unknown, doubtless await discovery.

This list, confessedly lacking in many forms which occur commonly in the immediate vicinity and whose ecological requirements are fully met at some place on the island, is of especial interest when compared with Dr. Hinds' total of 37 species for all North America,¹ with Moulton's 24 for the State of California,² and with Shull's 21 for Huron County, Michigan.³ It is interesting to note, too, the figures given by some of the more extensive lists: Uzel⁴ has 100 species from Bohemia; Reuter⁵ has 67 from Finland; Bagnall,⁶ 74 from the British Isles; Buffa,⁷ 31 from Italy; and Moulton,⁸ 118 from North America.

Using the totals given in this list in comparison with the number of Coleoptera known from the island, from North America and from the world, some interesting results are secured. The Coleoptera were selected for the reason that they are one of the best worked and most representative orders of insects, and because those of the island have been studied intensively. If they be used as the basis for calculation, and the number of species known from the island (now about 1,290), divided by the number of species of thrips (57), and the total number of species of beetles described from North America (19,000), divided by the quotient (22.6), we

¹Hinds, Warren Elmer: "Contribution to a Monograph of the Insects of the Order Thysanoptera inhabiting North America," Proc. U. S. Nat. Mus., Vol. XXVI, 1902, pp. 79-242, pls. I-XI.

²Moulton, Dudley: "A Contribution to our Knowledge of the Thysanoptera of California," Bur. Ent., U. S. Dept. Agr., Tech. Ser. 12, Pt. III, 1907, pp. i-vi, 39-68, pls. I-VI.

³Shull, A. Franklin: "Thysanoptera and Orthoptera," in Ruthven: "A Biological Survey of the Sand Dune Region on the South Shore of Saginaw Bay, Michigan," Publ. 4, Biol. Ser. 2, Mich. Geol. and Biol. Surv. 1911, pp. 177-231.

⁴Uzel, Heinrich: "Monographie der Ordnung Thysanoptera," 1895, pp. 1-472, pls. I-X.

⁵Reuter, O. M.: "Thysanoptera Fennica: Förteckning och Beskrifning öfver Finska Thysanoptera," Acta Soc. pro Fauna et Flora Fennica, Vol. XVII, No. 2, 1899, pp. 1-69, figs.

⁶Bagnall, Richard S.: "Notes on Some New and Rare Thysanoptera (Terebrantia), with a preliminary List of the known British Species," Journ. Econ. Biol., Vol. VI, 1911, p. 1-11.

⁷Buffa, Pietro: "Trentuna Specie di Tisanotteri Italiani," Atti. Soc. Toscana Sci. Nat., Mem., Vol. XXIII, 1907, pp. 1-78, Tav. I, II.

⁸Moulton, Dudley: "Synopsis, Catalogue, and Bibliography of North American Thysanoptera, with Descriptions of New Species," Bur. Ent., U. S. Dept. Agr., Tech. Ser. 21, 1911, pp. 1-54, pls. I-VI.

get 973 species of thrips for North America. Assuming again that the same proportion exists throughout the world, and that there are 150,000 described Coleoptera, we get 6,637 as the total number of Thysanoptera which will have been described from the world when that order is as well worked as the Coleoptera are at present. Certainly not more than four-fifths of the North American nor half of the world's Coleoptera are known. At this proportion the North American Thysanoptera will, when described, total nearly 1,200, while the number of species in the world will fall only slightly short of 13,000.

If, instead of the beetles, the birds be taken as the basis for calculations, and the assumed number of North American Thysanoptera (1,200) multiplied by 25 (the proportion existing between the avifauna of the world and that of North America), the result is 30,000 species of Thysanoptera.

After taking the mean of several such estimates, the author, in 1915, in a paper read before the Biological Society of Washington, placed the number of existing forms of thrips at 25,000.¹ This is considerably less than Mr. C. B. Williams' estimate made to the author in 1914. He is of the opinion that nearly 50,000 species will ultimately be described.

Suborder TEREBRANTIA Haliday

Superfamily ÆOLOTHRIPIDEA Hood

Family ÆOLOTHRIPIDÆ Uzel

1. *Æolothrips bicolor* Hinds.—July 13; one female, taken by sweeping. Known previously from Massachusetts, Florida, Tennessee, and Indiana, but occurs also in New York, Virginia, Maryland, Minnesota, Illinois, Kansas, and Texas (coll. Hood).

2. *Æolothrips annectans* Hood.—April 18 and May 14; two females, taken by sweeping (P. R. Myers and L. O. Jackson). Described from Maryland, Virginia and New York.

3. *Æolothrips crassus* Hood.—May 19 and 23; several females in flowers of water-leaf (*Hydrophyllum virginicum* L.)

¹See Science, N. S., Vol. XLJ, 1915, p. 877.

and wild grape. The species is probably predacious, and its occurrence on the above plants of little import. Described from Plummer's Island.

Superfamily THRIPOIDEA Hood

Family HETEROTHIRIPIDÆ Bagnall

4. *Heterothrips arisæmæ* Hood.—April 19–June 8; both sexes common in flowers of Jack-in-the-pulpit (*Arisæma triphyllum* L.) and green dragon (*A. dracontium* L.). Known previously from Illinois, Florida, Tennessee, and Virginia.

5. *Heterothrips vitis* Hood.—May 19–June 6; abundant in flowers of wild grape, smilax, and poison ivy (*Rhus toxicodendron* L.). Known from Maryland, Virginia, and the District of Columbia. Plummer's Island is the type locality.

Family THIRIPIDÆ Uzel

6. *Chirothrips manicatus* Haliday.—June 8; both sexes, taken by sweeping grass. A European species, recorded in North America from Massachusetts, Florida, Tennessee, Iowa, Nebraska, Oregon, and British Columbia; occurs also in New York, Pennsylvania, Maryland, Virginia, Illinois, and Kansas (coll. Hood). Often very abundant in the flowers of various grasses and cereals.

7. *Limothrips cerealium* Haliday.—June 8; two females, taken by sweeping grass. A European species, recorded in the United States from Pennsylvania, Massachusetts, Tennessee, and Florida; occurs also in Virginia, Maryland, District of Columbia, Indiana, Illinois, Texas, and Kansas (coll. Hood). Probably feeds exclusively on grasses and cereals.

8. *Frankliniella nervosa* (Uzel).—July 27–September 14; two females taken in sweepings from grass. Originally described from Bohemia; recorded in the United States from Massachusetts, Iowa, and Tennessee, but occurring also in New York, Pennsylvania, Maryland, Indiana, and Illinois (coll. Hood). It may be well to call attention to the fact that *nervosa* was found by Uzel in Bohemia, in the first spring flowers, while the American species, described one year later as *Thrips*

maidis Beach and afterwards placed in synonymy by Hinds, lives throughout the year on grasses. It would seem that we are here dealing with two distinct species, one of which will ultimately be known as *Frankliniella maidis* (Beach).

9. *Frankliniella fusca* (Hinds). *The tobacco thrips*.—May 18 and 19; two females, on basswood (*Tilia americana* L.) and mountain laurel (*Kalmia latifolia* L.). Known from Massachusetts, Virginia, District of Columbia, North Carolina, South Carolina, Georgia, Alabama, Tennessee, Texas, and Michigan; occurs also in New York, Maryland, Pennsylvania, Illinois, Missouri, South Dakota, Kansas, and Nebraska (coll. Hood). Very common on many plants, especially in the flowers; injurious to shade-grown tobacco in the South, causing "white veins."

10. *Frankliniella stylosa* Hood (= *Euthrips floridensis* Morgan).—April 6–August 18, October 12; abundant on various spring flowers, such as arrow-wood (*Viburnum acerifolium* L.), fringe-tree (*Chionanthus virginica* L.), moose-wood (*Dirca palustris* L.), mountain laurel (*Kalmia latifolia* L.), and wild yam-root (*Disoscorea villosa* L.). Described from Plummer's Island and re-described from Florida; taken also in Virginia, at Great Falls, Dyke, and Four Mile Run, and in Fairfax County directly opposite the island. Morgan's *Euthrips floridensis* is identical, two paratypes being available for comparison.

11. *Frankliniella tritici* (Fitch.) *The wheat thrips*.—March 30–November 19; common on nearly every species of plant examined. Recorded from New Hampshire, Massachusetts, New York, New Jersey, District of Columbia, Florida, Michigan, Illinois, Iowa, Texas, New Mexico, Washington, Oregon, California, and Barbados Islands; occurs also in Maryland, Virginia, Kansas, and Oklahoma (coll. Hood). Probably the most abundant thrips in North America.

12. *Oxythrips divisus* Hood.—April 18; several nymphs from scrub pine (*Pinus virginiana* Mill.). Very common in April and May on pines in the vicinity of Plummer's Island. Described from Maryland and Virginia.

13. *Pseudothrips inæqualis* (Beach).—May 18–July 27; both sexes, abundantly on leaves of black willow (*Salix nigra* Marsh.), and rarely in flowers of fringe-tree (*Chionanthus virginica* L.). Recorded from Iowa, Florida, and Tennessee; occurs also in Maryland, District of Columbia, and Illinois (coll. Hood).

14. *Anaphothrips obscurus* Müller. *The grass thrips*.—June 8; four females taken in sweeping from grass. Abundant and destructive in Europe and North America, producing the familiar “silver top” on many species of grasses. Recorded in America from Maine, Massachusetts, New York, Ohio, Michigan, Illinois, Iowa, Tennessee, Nebraska, California, and Ontario; occurs also in Pennsylvania, Maryland, District of Columbia, Virginia, Indiana, and North and South Dakota (coll. Hood).

15. *Aptinotrips rufus* (Gmelin), var. *rufus* only (=var. *connaticornis* Uzel).—April 20; on grass. Abundant and injurious throughout Europe; in the United States it has been recorded from Massachusetts, Michigan, Nebraska, and California, but occurs also in Maryland, New York, and Illinois (coll. Hood).

16. *Ctenothrips bridwelli* Franklin.—March 30–April 6; females common on the under surface of the leaves of wake robin or birthroot (*Trillium sessile* L.) and May-apple (*Podophyllum peltatum* L.), ovipositing in the latter plant. Recorded from New Hampshire, Michigan, and Tennessee; occurs also in Maryland, Virginia and Illinois (coll. Hood).

17. *Scolothrips 6-maculatus* (Pergande).—May 9–18; five females, taken on red cedar (*Juniperus virginiana* L.). Recorded from Iowa, Wisconsin, Missouri, Nebraska, South Carolina, Florida, and the Hawaiian Islands; occurs also in New York, Maryland, and Illinois (coll. Hood). A predacious species which has frequently been observed to feed on mites.

18. *Sericothrips cingulatus* Hinds.—June 8; two females, taken by sweeping grass. Recorded from Massachusetts, Tennessee, and Nebraska; occurs also in Maryland and Illinois (coll. Hood).

19. *Sericothrips pulchellus* Hood.—August 16; several specimens of both sexes on leaves of *Ptelea trifoliata*. Recorded only from Illinois.

20. *Scirtothrips ruthveni* Shull.—May 19; several females from leaves of mountain laurel (*Kalmia latifolia* L.). Known previously only from Huron County, Michigan, where it was taken in the terminal leaf clusters of red-osier dogwood (*Cornus stolonifera* Michx.).

21. *Scirtothrips niveus* Hood.—May 18; both sexes, on the under surface of leaves of flowering dogwood (*Cornus florida* L.). Known only from Plummer's Island.

22. *Scirtothrips brevipennis* Hood.—May 18; eight females, on red cedar (*Juniperus virginiana* L.). Known only from Plummer's Island.

23. *Echinothrips americanus* Morgan.—July 13–September 14; both sexes common in all stages on under surface of leaves of leaf-cup (*Polymnia* sp.) and touch-me-not (*Impatiens biflora* Walt. and *I. aurea* Muhl.). Known previously from Florida, Tennessee, Missouri, and District of Columbia.

24. *Heliothrips striatus* Hood.—July 27–October 12; both sexes common on the leaves of tulip-tree (*Liriodendron tulipifera* L.). Described from Maryland and Illinois; identified as *H. fasciatus* Pergande by A. C. Morgan, and recorded¹ under that name from Clarksville, Tennessee; occurs also in Virginia and the District of Columbia.

25. *Thrips tabaci* Lindeman. *The onion thrips*.—May 19; one female, in flower of fringe-tree (*Chionanthus virginica* L.). A very injurious, cosmopolitan species, probably occurring in every State of the Union.

26. *Thrips varipes* Hood.—March 30–April 6; eleven females, taken in flowers of *Muscari racemosum* (L.) Mill. and dog-tooth violet (*Erythronium* sp.). Known only from Maryland and Illinois.

27. *Thrips impar* Hood.—August 16–September 14; both sexes abundant in flowers of touch-me-not (*Impatiens* sp.).

¹Russell, Bull. 118, Bur. Ent., U. S. Dept. Agr., p. 15, 1912; and Morgan, Proc. U. S. Nat. Mus., Vol. 46, p. 43, 1913.

Plummer's Island is the type locality; recorded also from Illinois.

28. *Thrips winnemanæ* Hood.—May 19; two females (the types), taken in flowers of water-leaf (*Hydrophyllum virginicum* L.). Known only from Plummer's Island, Maryland.

29. *Thrips abdominalis* Crawford.—April 6–20; several females in flowers of *Senecio* and *Saxifraga*. Recorded from Mexico, Oklahoma, Florida, Georgia, and Virginia; occurs also in Maryland, Illinois, Kansas, and Texas (coll. Hood), often common in various flowers.

30. *Plesiothrips perplexus* (Beach).—July 27–September 14; three females, from axils of grass. Recorded from Iowa, Massachusetts, Florida, and Tennessee; occurs also in Maryland, Illinois, and Texas (coll. Hood).

31. *Microthrips piercei* Morgan.—September 1–14; both sexes, often abundant on the under surface of leaves of leaf-cup (*Polymnia* sp.) and rosin weed (*Silphium trifoliatum* L.). Recorded from Texas and Tennessee; occurs also in Virginia and Maryland (coll. Hood).

Family MEROTHRIPIDÆ Hood

32. *Merothrips morgani* Hood.—October 5; one female, under bark on fungus-covered branch of willow. Recorded from Illinois, Kentucky, and the District of Columbia; one female at hand from Pine Key, Florida, January, 1914, was found by Mr. R. C. Shannon in shells and débris taken by Mr. John B. Henderson.

Suborder TUBULIFERA Haliday

Superfamily PHLÆOTHRIPOIDEA Hood

Family PHLÆOTHRIPIDÆ Uzel

33. *Haplothrips statices* Haliday.—May 8; one female, probably in flight. An abundant, destructive species, described by Osborn under the name *nigra* but positively identical with the European *statices*.¹ It has been recorded in the United States

¹Hood, Ins. Insc. Menstr., Vol. II, 1914, p. 19.

from Massachusetts, Florida, Michigan, Iowa, Oregon, California, New York, Pennsylvania, District of Columbia, Maryland, Virginia, Illinois, South Dakota, and Montana.

34. *Haplothrips verbasci* Osborn.—July 27; both sexes common on mullein (*Verbascum thapsus* L.). Recorded from Massachusetts, Florida, Tennessee, Michigan, and Iowa; occurs also in Pennsylvania, Maryland, District of Columbia, Indiana, and Illinois (coll. Hood). Feeds exclusively on mullein.

35. *Zygothrips americanus* Hood.—Throughout the year, under loose bark of every species of tree examined. Recorded from Illinois, Michigan, Missouri, Nebraska, and Maryland; taken also in the District of Columbia, and at Vienna, Virginia (R. A. Cushman).

36. *Lissothrips muscorum* Hood.—April 12; several females from moss on tree trunk. Recorded only from Illinois; specimens at hand add Michigan, District of Columbia, and Maryland, to its known distribution.

37. *Hoplothrips karnyi karnyi* Hood.—May 18 and October 12; both sexes under hickory and willow bark. Known also from Illinois and Virginia. Plummer's Island is the type locality.

38. *Trichothrips angusticeps* Hood.—February 20; two females from beneath moist bark on maple log covered with *Polyporus*. Recorded only from Illinois; occurs also in Pennsylvania, Maryland, and Virginia (coll. Hood).

39. *Trichothrips flavicauda* Morgan.—October 5; two females and one male, under bark on fungus-covered willow branch. Described from Kentucky; in addition to the above-mentioned specimens, I have one female from Bluemont, Virginia, taken August 31 from a dead branch of pawpaw (*Asimina triloba* (L.) Dunal).

40. *Trichothrips anomocerus* Hood.—January 26–March 30; often abundant under sycamore bark. Taken at Vienna, Virginia, May 3, under bark of grape, by R. A. Cushman. Described from Plummer's Island, Maryland.

41. *Rhynchothrips tridentatus* (Shull).—April 6; one male taken on leaf of *Trillium*; a common species on various oaks,

the larvæ living in irregularities of the bark. Recorded only from Michigan; occurs also in Illinois, Missouri, Maryland, and the District of Columbia (coll. Hood).

42. *Rhynchothrips pruni* Hood.—February 2; one female and one male, taken under bark of wild cherry tree (*Prunus serotina* Ehrh.). Previously known only from Illinois.

43. *Rhynchothrips salicarius* Hood.—May 9–October 12; many females, taken at the base of young willow shoots, where their feeding deformed the young leaves and retarded the growth of the trees. Taken also at Bluemont, Virginia, August 31. Previously known only from Plummer's Island.

44. *Liothrips caryæ* (Fitch).—May 18–June 29; common in *Phylloxera* galls on leaves of hickory. Until its redescription in 1914, this species had been lost to science for nearly 60 years. Known from New York, Maryland, and Illinois.

45. *Liothrips citricornis* (Hood).—April 20–August 18; common on the under surface of the leaves of hickory and grape; occasionally also on dogwood (*Cornus florida* L.) and *Viburnum*. Recorded from Pennsylvania, Illinois, Michigan, and Tennessee; occurs also in Maryland, District of Columbia, and Virginia (coll. Hood).

46. *Liothrips leucogonis* Hood.—April 28; one female (the type) taken from *Ostrya virginiana* L. Known only from Maryland.

47. *Leptothrips mali* (Fitch) (= *Cryptothrips aspersus* Hinds).—Common from early spring to late fall, living singly on the leaves of various trees. Recorded from Massachusetts, Pennsylvania, Maryland, District of Columbia, Florida, Michigan, Indiana, Illinois, Tennessee, Missouri, Texas, California, Mexico, Panama, and Barbados; occurs also in Wisconsin, New York, and Virginia (coll. Hood). Mr. R. A. Cushman, of the Bureau of Entomology, has several times observed this species preying on aphids.

48. *Hoplandrothrips xanthopus* Hood.—August 11–October 12; abundant in dead leaves of maple, oak, and willow. Previously known only from Illinois and Pennsylvania; taken also by R. A. Cushman and the writer at Vienna, Virginia.

49. *Hoplandrothrips juniperinus* Hood.—May 9–19; abundant on dead branches of red cedar (*Juniperus virginiana* L.). Known only from two trees growing on Plummer's Island.

50. *Hoplandrothrips funebris* Hood.—May 9–October 12; both sexes common under loose bark of willow, oak, and cottonwood. Known from Illinois, Missouri, Maryland, District of Columbia, and Florida; taken also by R. A. Cushman and the writer at Vienna, Virginia.

51. *Hoplandrothrips insolens* Hood.—October 12 and April 12; one male, taken among dead leaves in fork of willow tree, and one female, taken under loose sycamore bark. Previously known from one female taken on elm in Illinois.

52. *Acanthothrips magnafemoralis* Hinds. — Is common throughout the year, under and on the bark of various trees, and in dried leaves, hibernating as adult. Pupæ taken May 12 matured May 23 and 25. Recorded from Florida, Massachusetts, Illinois, and Tennessee; occurs also in New York, Maryland, District of Columbia, and Virginia (coll. Hood).

53. *Cryptothrips junctus* Hood.—October 5; three males, taken under bark on dead willow branch. Recorded only from Michigan and Illinois; taken at Beltsville, Maryland, March 2, 1913, under bark of scrub pine (*Pinus virginiana* Mill.).

Family MEGATHRIPIDÆ Karny

54. *Megalothrips spinosus* Hood.—June 8–October 12; both sexes and many nymphs from dead leaves in fork of willow tree, and from dead willow branch. Recorded from Pennsylvania and Minnesota; occurs also in New York (coll. U. S. Nat. Mus.), Massachusetts, Virginia, Maryland, and Illinois (coll. Hood), often common in hollow twigs and in galls on golden rod stems.

Family IDOLOTHRIPIDÆ Bagnall

55. *Idolothrips coniferarum* Pergande.—April 20–June 8; abundant on red cedar (*Juniperus virginiana* L.). Recorded from Massachusetts and Virginia; occurs also in New Hampshire and Maryland (coll. Hood).

56. *Idolothrips tuberculatus* Hood.—June 29; one male, from branch of red oak. Recorded only from Illinois, but

occurring also in Missouri, Maryland, District of Columbia, and Virginia (coll. Hood).

57. *Idolothrips armatus* Hood.—July 13; one female, taken by sweeping grass. Previously known only from Illinois, where it is often abundant in old galls on golden rod (*Solidago*); occurs also in Maryland and Virginia (coll. Hood).

SUPPLEMENTARY LIST

The following species have been taken in the vicinity of the island:

1. *Æolothrips vittipennis* Hood.—May 9; one male, taken on leaf of hickory, near Plummer's Island. Previously known from Illinois and the District of Columbia.

2. *Frankliniella williamsi* Hood.—November 1; both sexes in abundance between the husks of standing and freshly cut Indian corn, at Georgetown, District of Columbia. Known also from Virginia.

3. *Odontothrips pictipennis* Hood.—May 19; one female (the unique type) from flower of *Azalea nudiflora* L., at Great Falls, Virginia.

4. *Cephalothrips yuccæ* Hinds.—Both sexes abundant at all seasons on *Yucca filamentosa*, near Plummer's Island. Previously known from Massachusetts, District of Columbia, Florida, Tennessee, and Barbados.

5. *Zygothrips harti* Hood¹ (= *Z. femoralis* Morgan²).—June 8–29; three females taken under dead bark of sumac (*Rhus* sp.) and by sweeping grass, near Plummer's Island. Recorded from Texas, Tennessee, Illinois, Virginia, and Maryland.

6. *Hoplothrips corticis* (De Geer).—November 1; both sexes under bark on dead willow branch, Rosslyn, Virginia. Described from Europe, and recorded in North America from Massachusetts, Connecticut, New York, and Illinois.

7. *Hoplothrips beachi* (Hinds).—November 1; both sexes under bark on dead willow branch, Rosslyn, Virginia. Re-

¹Proc. Biol. Soc. Washington, Vol. XXVI, p. 162; June 30, 1913.

²Proc. U. S. Nat. Mus., Vol 46, p. 40, figs. 76–79; August 23, 1913.

corded previously from Massachusetts, District of Columbia, Michigan, and Illinois.

8. *Neothrips corticis* Hood.—April 20; several specimens taken under loose scales of the bark of an apple tree at Cabin John, Maryland; four specimens under apple bark, Vienna, Virginia, November 7 (R. A. Cushman); abundant under apple bark at Bennings, District of Columbia, March 23. Recorded from Illinois and Michigan.

9. *Liothrips castaneæ* Hood.—May 19; several specimens from chestnut leaves, Great Falls, Virginia. Known also from Maryland and Connecticut.

10. *Liothrips brevicornis* Hood.—June 29; nymphs taken on leaves of sassafras, near Plummer's Island; one female from Beltsville, Maryland, May 2, 1915. Recorded only from Virginia.

11. *Hoplandrothrips microps* Hood.—September 7 and October 1; three females from dead branches of apple and willow, at Bennings, District of Columbia, and Rosslyn, Virginia. Recorded only from Illinois.

12. *Gastrothrips ruficauda* Hood.—May 23, October 1, and November 1; four females from dead willow and viburnum branches, at Rosslyn, Virginia, and Great Falls, Maryland. Recorded from Illinois and Virginia.

MISCELLANEOUS NEW AMERICAN LEPIDOPTERA

By HARRISON G. DYAR

HESPERIIDÆ

Vehilius norma, new species.

Dark brown; fore wing with fulvous shading along costa and inner margin half way out; a fulvous spot in interspaces 2-3 and 3-4 near their bases; two small subapical spots. Hind wing with fulvous shading over the disk. Beneath, fore wing with veins fulvous; the spots repeated. Hind wing with the

veins fulvous and an outer row of four small spots between the veins. Expanse, 26 mm.

Type, No. 21187, U. S. Nat. Mus.; Plantation Kitty, Georgetown, British Guiana, bred from larvæ on *Paspalum gracile*; a water-grass (H. W. B. Moore).

Vehilius sacchariphila, new species.

Dark brown, without fulvous shading; small spots in interspaces 2-3 and 3-4 of fore wing. Below, hind wing of a light gray-brown with mesial and outer black curved lines from vein 2 to costa, irregularly broken and dislocated at the veins. Expanse, 25 mm.

Type, No. 21188, U. S. Nat. Mus.; Plantation Non Pareil, Georgetown, British Guiana, bred from larvæ on blades of sugar cane (H. W. B. Moore).

NOCTUIDÆ

Grypotes, new genus.

Fore wing with accessory cell; hind wing with vein 5 weak, arising below center of cross-vein; tibiæ and tarsi unarmed; front with a hood-shaped process, forming a blunt central point, with a plate below; proboscis aborted; palpi slender, upturned to vertex; eyes large, naked.

Grypotes dentifer, new species.

Fore wing white, rather densely irrorated with brown and violaceous; a white streak on median vein at base, followed by the cusp of a broken brown subbasal line; inner line brown, sharply angled outward to the position of orbicular, then inward on median vein, then outward in another tooth on submedian fold; median space filled with irrorations up to the cell, with luteous streaks on submedian and discal folds; reniform large, white, with a brown annular center; outer line brown, toothed on costa and followed by pure white there, rounded over reniform, denticulate below; terminal space gray, with a brown shade from costa to reniform and a submarginal shade, narrow above, very wide below; a row of terminal brown dashes. Hind wing whitish, a little powdered

with brown outwardly, with curved mesial line and terminal dashes as on fore wing; fringe white. Expanse, 26 mm.

Type, male, No. 21190, U. S. Nat. Mus.; Las Vegas Hot Springs, New Mexico, August 9 (H. S. Barber).

Grypotes borealis, new variety.

A pale, depauperate form. White, the lines and shades faint; reniform obsolete. Expanse, 23 mm.

Type, male, No. 21191, U. S. Nat. Mus.; White River, Stanley County, South Dakota (W. H. Over). Also a female with the same data, smaller and suffused with irroration, the markings hardly legible.

LITHOSIIDÆ

Crambidia myrlosea, new species.

Head white, thorax gray. Fore wing with the costa broadly white, succeeded by dark gray, the veins faintly paler, especially toward costa. Hind wing dark gray. Expanse, 22 mm.

Type, male, No. 21192, U. S. Nat. Mus.; Kerrville, Texas, June 12, 1907 (F. C. Pratt). Also a female from the same place, October, 1904 (H. Lacey).

NOTODONTIDÆ

Datana diffidens, new species.

Head yellowish, shading to brown in the anterior thoracic patch; thorax posteriorly silvery gray. Fore wing uniform brown, a little clay-yellowish on costa, densely sprinkled with silvery gray scales; inner and outer lines slender, brown; discal lines obsolete; discal dots dark, marked with silvery gray scales; subapical line distinct between veins 7 and 4. Hind wing pale cream-color, powdered with brown and silver-gray outwardly. Expanse, 46 mm.

Type, male, No. 21189, U. S. Nat. Mus.; Victoria, Texas, 1916 (K. J. Leffland). Also two females with two oblique central lines showing, from the same place, May 3 and 17, 1908, "defoliating oaks" (J. D. Mitchell).

DREPANIDÆ

Eudeilinea luteifera, new species.

White; fore wing with two curved irregular pale buff lines. Hind wing similar, the inner line small. Expanse, 25 mm.

Type, male, No. 21186, U. S. Nat. Mus.; Dallas, Texas, April 2, 1907 (F. C. Pratt).

GEOMETRIDÆ

Eucymatoge spermaphaga, new species.

Fore wing gray with fine black lines and two broad red-brown bands; basal space gray, crossed by a dentate black line, distinct on costa; a broad red-brown band without borders, bent on subcostal vein; just beyond, a slender black line, dividing the faint, double, white, crenulate inner line; a black blotch on costa just above the faint discal dot, followed below by a small black patch and traces of a line across the wing; outer line double, white, crenulate and gently excurved on its middle half, preceded by a black blotch on costa and cuneiform black marks on the veins below; vein 1 narrowly black between the lines; beyond the outer line, a broad red-brown band, narrowing below vein 4 and then expanding a little, followed by the dentate-crenulate white subterminal line, which is cut by black cusps on the veins, emanating from the brown band; termen narrowly dark gray; a black terminal line; fringe gray, with rounded dark spots at the ends of the veins. Hind wing with the base dark gray; rest of wing gray, with four faint dark lines across the median space; discal dot gray; outer line double, whitish, crenulate; the space following, dark gray; subterminal line white, dentate-crenulate; a broken black terminal line. Expanse, 23 mm.

Type, male, No. 21181, U. S. Nat. Mus.; Kaolin Beds, Oregon, June 12, 1916, reared from larvæ in cones of *Abies concolor* (J. E. Patterson) (Hopk. U. S. 13290b).

Other specimens: Ashland, Oregon, June 14, 1915, reared from larvæ in cones of *Pseudotsuga taxifolia* (J. E. Patterson) (Hopk. U. S. 12536aa); Applegate River, California, September 23, 1915, reared from larvæ in cones of *Abies*

shastaensis (Miller & Sargent) (Hopk. U. S. 14205j); Sequoia National Forest, California, September 24, 1914, reared from larvæ in cones of *Abies concolor* (J. M. Miller) (Hopk. U. S. 12577bb); Orono, Maine, July 21, 1911, reared from larvæ in cones of spruce (Maine Agr. Exp. Sta., Lot 1386, Sub. 7).

NOTES ON NORTH AMERICAN PYRAUSTINÆ

(*Lepidoptera, Pyralidæ*)

BY HARRISON G. DYAR

I have gone over rather carefully the Pyraustinae listed in Barnes & McDunnough's recent "List." The omissions and errors are not as insignificant as I had anticipated, and may profitably be noted. I use this opportunity to add a few new records.

4910. *Glaphyria reniculalis* Zell. has been transferred to *Egesta* Ragonot. I think it should be returned to *Glaphyria*. The generic differences given by Hampson of the pectination of the median vein of hind wing are unsatisfactory, but there remains the difference in length of the maxillary palpi. These are long in *Egesta* and short in *Glaphyria*. Now in *reniculalis* the maxillary palpi are plainly short.

4903. On the other hand, *reluctalis* Hulst should go to *Egesta*, as the maxillary palpi are long. It will come very close to *simplicialis* Kearf. (Can. Ent., xxxix, 4, 1907), which is obviously nothing but *reluctalis* with the white inner band replaced by a dark shade.

4906. My single specimen of *basiflavais* B. & McD., taken at Palm Beach, Florida, January 27, 1900 (H. G. Dyar), is unfortunately without a head; but veins 10-11 are stalked and therefore the species cannot be placed in *Lipocosma* where its general appearance would make it seem more at home.

4907. *Glaphyria dualis* B. & McD. has the maxillary palpi about as long as the labial palpi and should be transferred to *Egesta*.

4916. *Symphysa adelalis* Kearf. (Journ. N. Y. Ent. Soc., xi, 145, 1903) is correctly transferred to *Lipocosma*.

4913, 1. *Lipocosma diabata*, new species.

White, uniformly shaded with brown; lines slender, brown, not defining a central darker area as in *sicalis* Walker; inner line excurved subcostally, coarsely dentate; outer line excurved above, inbent at vein 3; reniform an ellipse; a terminal broken black line. Hind wing with the costal area white; outer line slender, black, inbent at vein 2; black powdering in median space below the cell. Expanse, 14 mm.

Type, female, No. 21151, U. S. Nat. Mus.; Florida (Schaus coll.).

4921, 1. *Desmia nominabilis* Hering (Stett. ent. Zeit., lxxvii, 55, 1906) is omitted. The supposed species I believe to be only a variety of *D. funeralis*, probably the same as *subdivisalis* Grote; but the name should be cited.

4950. *Heydelepta futillalis* B. & McD. is obviously a synonym of *Syngamia haemorrhoidalis* Guen.

4944. *Conchyloides ovulalis* Guen. is correctly identified. This name is not a synonym of *platinalis* Guen. as given in my list (No. 4297). *C. platinalis* is a distinct species which has not yet been recorded from the United States.

4952, 1. *Bocchoris rehamalis* Dyar (Proc. U. S. Nat. Mus., xlvii, 393, 1914) may be added. I have a specimen from Kerrville, Texas, May 31, 1906 (F. C. Pratt).

4957. *Nacoleia hampsoni* B. & McD. occurs also in Cuba and it may prove to be one of Herrich-Schäffer's unrecognized species (listed by Hampson, Proc. Zool. Soc. Lond., 1899, 287 et seq.). Hampson would place this in *Lygropia*, as he has all the species allied to it. One of my Florida specimens bears a label in Schaus' writing: "Near *Lygropia xanthogonialis* Hamps." I do not find that Hampson has published this name, but he may have done so. The matter should be kept in mind.

4964. *Sylepta masculinalis* B. & McD. is not before me, but the figure and description agree so completely with *Syngamia*

micromphalis Hampson that I have no hesitation in pronouncing it a synonym.

4965. *Sylepta brumalis* B. & McD. is quite obviously a synonym of *S. cephalis* Walker.

4962. I have seen no specimen that would agree well with Lederer's figure of *fluctuosalis*. The species in our collection over this name is *Sylepta silicalis* Guen. (see Hampson, Proc. Zool. Soc. Lond., 1898, 720, for synonymy), which name should be added to the list.

4966, 1. *Sylepta miamialis* Schaus. I do not find that a description has been published.

"*Sylepta miamialis*, n. sp.—Dark vinous red; head with a whitish vertical spot; venter and legs white. Fore wing dark vinous red, darkest on the basal half of costa; discal mark reniform, dark purple; inner line invisible, outer line faint and slender, curving outward around cell; a dark terminal line; the fringe gray. Hind wing sordid, stained with dark vinous outwardly; a small gray discal dot. Expanse, 21–23 mm.

"Miami, Florida (W. Schaus), 1 male, 2 females. Type. No. 21153, U. S. Nat. Mus.—W. Schaus."

4985. *Sameodes adipaloides* G. & R. should be given varietal rank, I think.

5047, 1. *Syngamia florepicta* Dyar should be added. I have specimens from Raleigh, North Carolina, August 5, 1907 (C. S. Brimley); Hattiesburg, Mississippi, June 18, 1915 (J. W. Champlin).

5055. *Metasia argalis* Fernald is made a synonym of *D. elegantalis* Warren. I think this is incorrect. Specimens of *elegantalis*, identified by Fernald, differ conspicuously from *argalis*, the type of which is before me. Among other things, the reniform of *elegantalis* is filled with white, while *argalis* has a dark gray reniform. The hind wings also differ.

5052 and 5056. *Diasemia zephysalis* B. & McD. and *Diasemia leucosalis* B. & McD. correspond closely to *D. particolor* Dyar and *D. crubescens* Hampson, from Mexico, but are distinct on details in both cases. I have *D. leucosalis* also from

Mexico: Popocatepetl Park, Mexico, 8,000 feet, June, 1906 (W. Schaus).

5057. *Diasemia fenestralis* B. & McD. is not before me, but the figure looks as if the species belonged in the genus *Clupeosoma* Snellen of the Hydrocampinæ. A re-examination of the venation will decide. It seems close to *C. lavinia* Schaus (Ann. Mag. Nat. Hist., (8), ix, 679, 1912), differing chiefly in the lack of widening of the inner line on inner margin.
- 5057, 1. *Ischnurges chromaphila* Dyar should be added. I have specimens from Santa Rita Mountains, Arizona, May 25, 1898 (E. A. Schwarz); Southern Arizona (O. C. Poling); Cochise County, Arizona, September 30 and October 7, 1904 (through G. Franck).
5081. *Titanio helianthales* Murtfeldt (1897) should have as synonym, *Pionca thyanalis* Druce, Biol. Cent.-Am., Lep Het., ii, 557, 1899.

***Titanio murmuralis*, new species.**

Fore wing dark gray, marked with pure white; a subterminal line starts from near apex, curving close to margin, oblique below to middle of inner margin; cell white with two black lines; costa and submedian fold white to two-thirds; all the veins beyond cell radially white lined; a black terminal line, preceded by white; fringe white with two gray interlines. Hind wing gray with whitish outer line; fringe as on forewing. Expanse, 12 mm.

Type, female, No. 21293, U. S. Nat. Mus.; Sabinal, Texas, March 2, 1911 (F. C. Pratt).

Close to *T. helianthales* Murt., but smaller, the outer line narrower and more sharply drawn, the veins white-lined.

5104. *Cindaphia angustalis* Felder. The correct name is *angustalis* F. & R. Hampson's uncorrected typographical error (Proc. Zool. Soc. Lond., 1899, 245) has been copied both here and in the "Contributions," ii, 224, 1914.
5092. *Phlyctaenia rusticalis* B. & McD. closely resembles *Pionca deterrentalis* Walker. I do not make the synonymy positive because I have *detersalis* only from Ecuador and

Peru and do not know if it ranges to the Mexican Plateau.

5132, 1. *Pyrausta fumipennis* Warren (Ann. Mag. Nat. Hist., (6), ix, 392, 1892) is omitted. It was described from California.

5153. Walker's *orphisalis* seems to have been misidentified in my catalogue. Barnes & McDunnough apparently recognize both this species and *ochosalis* Dyar; but Schaus has labeled a specimen of *ochosalis*: "*Pyrausta orphisalis* Walk., comp. B. M." I suspect, therefore, that there is but one species concerned.

5177, 1. *Pyrausta achroalis* Hampson (Ann. Mag. Nat. Hist., (8), xii, 26, 1913) should be added. I have a specimen from Miami, Florida (W. Schaus). The species looks quite out of place in *Pyrausta* and perhaps a separate genus may be justified.

5177, 2. The genus *Bocotarcha* Meyrick should follow here with two species: *B. demantrialis* Druce (Biol. Cent.-Am., Lep. Het., ii, 270, 1895), which I have from Newark, New Jersey, August 23, 1899 (A. J. Weidt); Pittsburgh, Pennsylvania, July 30 and August 4, 1906 (H. Engel); New Brighton, Pennsylvania, August 21, 1902 (H. D. Merrick); Cove Mountains, Pennsylvania, July 27 and August 3, 1913 (E. Daecke); Kerrville, Texas, September, 1906 (H. Lacey); Southern Arizona (O. C. Poling).

5177, 3. *B. stigmosalis* Warren (Ann. Mag. Nat. Hist., (6), ix, 209, 1892), which I have from Miami, Florida (W. Schaus).

5177, 4. Also *Asochis* Walker, with one species, *A. rufidiscalis* Hampson (Ann. Mag. Nat. Hist., (7), xiv, 186, 1904), = *cubanal* Hampson (Ann. Mag. Nat. Hist., (8), xi, 337, 1913), which I have from Miami, Florida (W. Schaus).

5181. After studying Warren's description, I cannot see in *Cornifrons pulveralis* anything more than a form of *simalis* Grote. The home of the typical *simalis* is the Rocky Mountain region of Colorado. In the Great Basin it takes a smaller, lighter form, *pulveralis* Warren. I have this form from Placer County, California, June (through C. V.

Riley); Bluff, Utah, June 12, 1898 (Mrs. H. M. Peabody); Southern Utah, July, 1900 (O. C. Polih); Williams, Arizona, July 19 (Schwarz & Barber).

Farther south a form occurs for which I propose the name

Cornifrons sideralis, new variety.

Uniform iron-gray, the black and white scales evenly mixed; inner line running out sharply almost to the discal dots; subterminal white mark narrow and straight.

Type, female, No. 21155, U. S. Nat. Mus.; Argus Mountains, California, April, 1891 (A. Koebele). Also another female from the same place and a third, in poor condition, Arroyo, 10 miles west of La Luz, New Mexico, August 23 (Townsend & Cockerell).

Again, in the north, another form occurs which may be called

Cornifrons præia, new variety.

Violaceous gray, uniform, the ground not appearing white, the markings fine and brown.

Type, male, No. 21156, U. S. Nat. Mus.; Pullman, Washington, May 10, 1895 (C. V. Piper). Also two males from the same locality, May 11, 1898 (Wash. Exp. Station, Nos. 216 and 227).

5181.1. **Cornifrons phasma**, new species.

White, with very pale ocherous shades, at base and in median space; inner line oblique, brown, not reaching costa or margin; no discal dot or a trace; outer line brown, denticulate, slightly excurved over cell; a line of purplish shading from apex running to outer line below. Hind wing white; a pale fuscous outer line close to terminal pale fuscous border. Expanse, male 25 mm., female 21 mm.

Types, male and female, No. 21157, U. S. Nat. Mus.; Los Angeles County, California, May (D. W. Coquillett).

Cornifrons chlorophasma, new variety.

Entirely white with a faint ocherous tint, all the markings absent.

Type, female, No. 21158, U. S. Nat. Mus.; Argus Mountains, California, April, 1891 (A. Koebele, through C. V. Riley).

This species, in both forms, differs easily from *simalis* Grote in the shape of the frontal process, which is not simply hood-shaped and scaled, but runs out into a bare, quadrate vertical blade.

NOTES ON NORTH AMERICAN NYMPHULINÆ

(*Lepidoptera, Pyralidæ*)

By HARRISON G. DYAR

Elophila fulicalis Clemens.

Cataclysta fulicalis Clemens, Proc. Acad. Nat. Sci. Phil., xii, 217, 1860.

Cataclysta angulatalis Lederer, Wien. ent. Mon., vii, 453, 486, 1863.

This species can be distinguished from *opulentalis* Led. by the presence of a small black discal dot on fore wing and the absence of a distinct narrow dark line on hind wing. *Opulentalis* has a discal ringlet, not a dot.

The following may be races of *fulicalis*, but for the present, I give them specific rank.

Elophila satanalis, new species.

Fore wing with the base brown; subbasal line white, diffused; a broad brown band, stained with orange in the middle, followed by a straight white line with dark outer edge; middle field brown above, irrorate with black below; a blackish discal spot in a brown cloud; an orange line from discal dot to tornus; oblique subapical and subterminal white lines separated by an orange spot; terminal band orange. Hind wing with the broad band containing an orange spot, its outer edge angled and followed by a more or less distinct line; black irrorations all the way across the median space; terminal dots not preceded by a line. Expanse, 18 mm.

Type, female, No. 21182, U. S. Nat. Mus.; Devil's River, Texas, May 6, 1907 (Bishop & Pratt). Also in southern Arizona.

Elophila truckeealis, new species.

Fore wing with the base brown; subbasal line white, diffused; a broad brown band with slight luteous dilution centrally; median line white, angled subcostally in the female, straighter in the male, though flexuous, followed by black; a black discal dot with a little orange beyond it; middle field brown above and along median vein, irrorate with black below; a short white outer line from vein 2 to inner margin, edged with black within; subapical oblique white band slender, curved; subterminal half-line white; terminal line orange. Hind wing gray on basal half with central pale dilution and trace of orange, ending in a median double angled line; a black discal dash in irrorations, which cross two-thirds of the wing; marginal dots separated by leaden, with preceding line only at apex and tornus. Expanse, 19 mm.

Type, female, No. 21183, U. S. Nat. Mus.; Reno, Nevada, July 14, 1915 (H. G. Dyar). Also from Klamath Lake and Salem, Oregon.

Elophila opulentalis Lederer.

Cataclysta opulentalis Lederer, Wien. ent. Mon., vii, 453, 486, pl. 18, fig. 7, 1863.

Cataclysta confusalis Walker, Cat. Brit. Mus., xxxiv, 1334, 1865.

Elophila moniligeralis Lederer.

Cataclysta moniligeralis Lederer, Wien. ent. Mon., vii, 454, 487, pl. 18, fig. 10, 1863.

Elophila slossonalis Dyar, Journ. N. Y. Ent. Soc., xiv, 93, 1906.

Mr. Schaus has labeled a specimen: "*moniligeralis* Led. Comp. B. M." Certainly Lederer's figure does not suggest this identification. However, the probability is that the figure is a product of the artist's imagination, at least the part beyond the middle of the fore wing, for Lederer says: "die äussere [Linie] an meinem etwas verwischten Exemplare nicht ganz bestimmt zu erkennen." Doubtless the whole half of the wing was il-

legible in the single male type; but the artist had to draw something, and hence the strange pale border with inward curve below. Lederer's description makes no mention of this.

***Elophila cancellalis*, new species.**

Fore wing white, but the markings predominant; base filled with dark brown; a white subbasal line, angled on vein 1; a broad dark brown band, followed by a white mesial line and a narrow brown line, angled in cell and on vein 1; middle area white, shaded with brown on costa; traces of powdery orbicular and reniform; outer line brown, slender, oblique, in a white space to vein 4, retracted and roundedly incurved to vein 1, then oblique to the inner margin; terminal space dark-filled; a white subterminal line to vein 2; an orange terminal line, edged by brown on both sides. Hind wing with a broad dark brown band, cut by a white line beyond base, not reaching costa; a slender median brown line, coarsely angled; upper half of median space with a dark brown patch of solidified powdering, with irregular vacuolated center; a terminal band of dark, containing round black spots with metallic edging, preceded by yellowish and a fine black crenulate line. Expanse, 16 mm.

Type, female, No. 21184, U. S. Nat. Mus.; Devil's River, Texas, May 6, 1907 (Bishopp & Pratt).

***Elophila irroratalis*, new species.**

Fore wing with an irregular black line near base, followed by a broad dilution, then brown-shaded; middle line black, angled in the cell, oblique below; median space pale gray, with longitudinal bands of black irrorations in cell and submedian space; outer line black, oblique, then faint and curved, running in below vein 1, almost parallel to inner margin; a black triangular subapical shade, followed by a white one; terminal band orange, black-lined on both sides. Hind wing whitish near base, with black irrorations thence to marginal marking; a central black line; marginal dots black, resting in a leaden border and preceded by an orange space. Expanse, 14 mm.

Type, female, No. 21185, U. S. Nat. Mus.; Archer, Florida, March 9, 1882 (A. Koebele, through C. V. Riley).

Also a female, Florida (Schaus collection) ; a male and three females, Lakeland, Florida, March, 1913 (C. N. Ainslie) ; and a male and female, smaller and not exactly identical, Florida (Schaus collection).

***Elophila plevie*, new species.**

Fore wing white ; a brown inbent line close to base ; a broad brown shade preceding the inner line, which is narrow, blackish, slightly oblique, and a little angled centrally ; outer line blackish, narrow, oblique, from costa to vein 3, then faint, but incurved to submedian fold, forming an obsolete angle, running out again in a distinct angle and inwardly oblique to inner margin ; a broad brown shade, broadest on costa, angled on submedian fold ; a cuneiform white space, tapered below ; terminal line red, narrowly edged with dark on both sides. Hind wing whitish ; a narrow mesial brown-gray line ; a diffused gray loop on upper half of wing outwardly, followed by a trace of orange ; terminal dots with metallic scales in a leaden margin, a trace of inner border-line apically ; fringe whitish. Expanse, 13 mm.

Type, female. No. 21314, U. S. Nat. Mus. ; Weld, Maine, July 27, 1910, flying in cat-tail reeds on the lake (H. G. Dyar).

***Elophila imitabilis*, new species.**

Fore wing dark brown ; a narrow oblique white patch on inner margin at basal fourth ; a larger, but still narrow and oblique patch at middle, rising to median vein ; a curved white subterminal line from apex to vein 2, followed by a red line. Hind wing white, a double brown band across middle, angled on submedian fold, without red ; a patch of gray irroration from costa to vein 2 ; a marginal row of five black spots with metallic scales ; some orange beyond them, none before. Expanse, 10 mm.

Type, male. No. 21313, U. S. Nat. Mus. ; Lakeland, Florida, March, 1913 (C. N. Ainslie). Also two males, Florida (Schaus collection) and four females, respectively, Florida (Schaus collection) ; Lakeland, Florida, March, 1913 (C. N. Ainslie) ; Hastings, Florida, June (W. D. Kearfott) ; Fort Drum, Florida (U. S. Dept. Agriculture).

Clupeosoma lavinia Schaus.

Clupeosoma lavinia Schaus, Ann. Mag. Nat. Hist., (8), ix, 679, 1912.

Diasemia? fenestralis Barnes & McDunnough, Cont. Nat. Hist. Lep. No. Am., ii, 235, 1914.

I noted the above synonymy as probable in my paper on *Pyraustinae* preceding.

Clupeosoma eumoros, new species.

Fore wing elongate, the outer margin slightly excavate at vein 2 and subapically, the fringe touched with white in both places. Pale straw yellow; lines brown, faint; inner line angled on median vein; outer line slightly irregular; a clouded discal spot, far out; margin brown shaded; a terminal blackish line; the fringe brown except where tipped with white. Hind wing concolorous, with traces of an outer line; fringe intermixed with white. Expanse, 25 mm.

Types, two males, No. 21311, U. S. Nat. Mus.; Tonto Basin, Gila County, Arizona, June 1-7 (collector unknown); Poland, Arizona, April 24, 1903 (Mrs. H. M. Peabody).

**NOTES ON NORTH AMERICAN SCHÆNOBIINÆ**

(*Lepidoptera, Pyralidæ*)

By HARRISON G. DYAR

In their recent "List" (No. 5306), Barnes & McDunnough would sink *Scirpophaga consortalis* Dyar as a synonym of *repugnatalis* Walker. This is incorrect; *repugnatalis* has a distinct design of transverse blackish lines, a large reniform outlined in dark, sometimes filled with sordid silvery, and small silvery spots in the fringe. In *consortalis* there are no transverse markings whatever, while the fringe is without white dots.

Rupela albinella Cramer.

Tinea albinella Cramer, Pap. Exot., iv, 163, pl. 372, f. D, 1782.

Rupela nivea Walker, Cat. Brit. Mus., xxviii, 524, 1863.

Scirpophaga albinella Hampson, Proc. Zool. Soc. Lond., 1895, 914.

Rupela holophaealis Hampson.

Scirpophaga holophæalis Hampson, Ann. Mag. Nat. Hist., (7), xiv, 181, 1904.

Storteria unicolor Barnes & McDunnough, Cont. Nat. Hist. Lep. No. Am., ii, 178, 1913.

Rupela unicolor Dyar, Ins. Insc. Menstr., i, 105, 1913.

The above synonymy should replace Nos. 5306 and 5307 in Barnes & McDunnough's "List." The genus *Rupela* (type, *albinella* Cramer) has the palpi slender, upturned; maxillary palpi well developed; fore wings with veins 8-10 stalked; outer margin entire and evenly curved; vein 11 free. It falls in the table remote from *Scirpophaga*.

Schœnobius pallulellus Barnes & McDunnough.

Undistinguishable from the pale yellow, immaculate form of *melinellus* Clemens. Uniting Nos. 5311 and 5313 of the "List."

Schœnobius clemensellus Robinson.

As synonyms of this, I place *unipunctellus* Rob. and *tripunctellus* Rob. Uniting Nos. 5309, 5310, and 5312 of the "List."

Schœnobius amblyptepennis, new species.

Female. Fore wing pointed at apex, outer margin oblique, about as in the male of *clemensellus*, not falcate. Straw-yellow irrorate with brown; a brown oblique line from apex, directed toward middle of inner margin, fading out at vein 1; a small black discal dot. Hind wing white, tinged with straw-color. Expanse, 23 mm.

Type, female, No. 21169, U. S. Nat. Mus.; St. Johns, Quebec, July 11, 1915 (W. Chagnon).

The male is scarcely distinguishable from *S. forficellus* Thunb. One female is pale straw-yellow, immaculate, like *S. melinellus* Clem. except for the wing shape.

I cite the following labels: "N. Amer. als *forficellus*. v. Schläger. *Chilo longirostrellus* Cl. ♂;" Cohasset, Massachu-

setts, July 6 and August 7, 1907 (O. Bryant); Chicago, Illinois (A. Kwiat); Plummer's Island, Maryland, June 5 (W. V. Warner); Washington, District of Columbia (A. Busck), June 14 (A. N. Caudell); Oak Station, Pennsylvania, June 6, 1911 (F. Marloff).

Schoenobius melinellus Clem., form **uniformellus**, new.

Female. Wings pointed, falcate; fore wing uniform dark brown, with small discal dot. Hind wing white. Expanse, 25 mm.

Type, female, No. 21170, U. S. Nat. Mus.; Washington, District of Columbia, July, 1901 (A. Busck).

I have this dark form of *melinellus* also from St. Therèse Island, Quebec, July 28, 1915 (W. Chagnon); St. Johns, Quebec, July 31, 1915 (W. Chagnon); Cranmoor, Wisconsin (Hardenberg); Winnipeg, Manitoba, (A. W. Hanham), Denver, Colorado (male), July 29, 1904 (E. J. Osler); Turtle Mountains, North Dakota (A. H. Verrill).

Schoenobius roscidellus, new species.

Male. Palpi long; fore wings rounded at the tips, shining gray; all the veins rather broadly lined in pale straw-color; a round black discal dot. Hind wing white. Expanse, 16 mm.

Type, male, No. 21171, U. S. Nat. Mus.; Fort Meade, Florida, April (J. A. Grossbeck).

The female has the fore wing pointed, subfalcate, the markings less contrasted. Anal tuft copious, dark gray. Expanse, 23 mm.

Miami, Florida (W. Schaus).

A second male, without data, was sent to Prof. C. H. Fernald under red number 162 and labeled by him: "*Schoenobius unipunctellus* Rob? A variable sp." I think, though, that it has no connection with *unipunctellus*=*clemensellus*.

Schoenobius nitidellus, new species.

Male. Fore wing rounded at the tips, shining dark gray, the veins narrowly and not prominently lined in blackish; a small black discal dot. Hind wing dark silky gray. Expanse, 21 mm.

Type, male, No. 21172, U. S. Nat. Mus.; Esperanza Ranch, Brownsville, Texas (J. Doll).

Sent to Prof. C. H. Fernald and labeled by him: "*Schoenobius sordidellus* Zinck?" It is, however, much smaller than *sordidellus* and of a different wing-shape.

Professor Fernald's determinations, with marks of doubt attached, show that he recognized these forms as different, but preferred to associate them with an allied species rather than return them to the museum labeled "new" on his authority.

Patissa parthenialis, new species.

Fore wing silvery white, crossed by yellow bands with powdery brown edges; an oblique streak at base, not attaining costa; an oblique band of three patches, cut by vein 1 and median vein, the uppermost patch in the cell; a less oblique band in middle of wing, ending in a blotch at end of cell; an outer band and a submarginal band, broad, parallel to outer margin. Hind wing white with three powdery blackish streaks crossing submedian fold. Expanse, 14 mm.

Type, female, No. 21173, U. S. Nat. Mus.; Vernon Parish, Louisiana, July (G. Coverdale, through W. D. Kearfott).

Patissa chrysozona, new species.

Fore wing silvery white, marked as in the preceding species except that the basal bands are more oblique, the two marginal bands well separated from them and leaving a broad white median space, which, on the inner margin, occupies one-third of the margin. The middle band, ending in the discal spot, runs obliquely as to the outer bands, while in *parthenialis* it is nearly parallel to them.

Type, female, No. 21174, U. S. Nat. Mus.; Texas (Coll C. V. Riley).

Alpheias transferens, new species.

Dark gray; a white streak obliquely from the discal dot to the costa; basal space brownish; inner line distinct, white, angled on submedian fold and median vein, oblique inwardly to costa; outer line faint, whitish, angled inward on discal

fold; margin lighter; a row of terminal black dots. Hind wing gray, whitish on inner field. Expanse, 15 mm.

Type, male, No. 21175, U. S. Nat. Mus.; Claremont, California (C. F. Baker).

***Alpheias nigrocinereella* Hulst.**

While the female type has vein 7 arising after 9 and therefore falls in *Macrotheca*, a male from the same breeding has 7 arising before 9. Moreover, specimens from Stockton, Utah, and Reno, Nevada, have 7 before 9, so that I think the variation of the type is abnormal and that the species should fall in *Alpheias*.

***Macrotheca leucocope*, new species.**

Pale gray, powdery on a nearly white ground, the veins darker toward base; a white ray along median vein, widening to end of cell, where it terminates; a terminal dark line, hardly broken. Hind wing dark gray, fringe pale. Expanse, 19 mm.

Type, male, No. 21176, U. S. Nat. Mus.; Denver, Colorado (W. Schaus).

Labeled by Mr. Schaus: "*Macrotheca interalbicans*," but it does not agree at all with Ragonot's figure of *M. interalbicalis*.

***Macrotheca vulnifera*, new species.**

Whitish gray, coarsely powdered with black; basal space darker; an oblique black shade from apex, which the outer line crosses, narrow, black, edged with whitish without, gently excurved below; discal dot elongate, elliptical, longitudinal; a terminal crenulate black line. Hind wing soiled silky whitish, gray along costa. Expanse, 15 mm.

Type, male, No. 21177, U. S. Nat. Mus.; Yavapai County, Arizona, August (W. D. Kearfott).

This is what Barnes & McDunnough figure as *M. interalbicalis* Rag. (Cont. Nat. Hist. Lep. N. A., I, No. V, Pl. III, ff. 9 and 12, 1912); but I am unable to reconcile it with Ragonot's figure.

Loxotegopsis, new genus.

Generally similar to *Obtusipalpis* Hampson (Proc. Zool. Soc. Lond., 1895, 906). Wings longer and narrower; palpi not blunt, the third joint pointed with hairs and downcurved; venation similar, veins 4-5 of hind wing not approximated on basal portion.

Loxotegopsis polle, new species.

Fore wing light brown, shaded with dark brown, usually along the margins, but sometimes covering the whole wing, except a small space about the stigmata; inner line broad, curved, dark brown, followed by a claviform streak on submedian fold; orbicular a thick dash; reniform a ringlet; outer line thick, gently excurved above, nearly straight below; termen dark-shaded; fringe silky shining. Hind wing silky, slightly yellowish; termen narrowly dark. Expanse, 12-15 mm.

Type, male, No. 21167, U. S. Nat. Mus.; Brownsville, Texas, May 9, 1904 (H. S. Barber). Many other specimens from the same locality.

SEVEN NEW CRAMBIDS FROM THE UNITED STATES

(*Lepidoptera, Pyralidæ*)

By HARRISON G. DYAR

Diatræa evanescens, new species.

Fore wing light buff, the veins lined with dark brown, but not contrastingly; also single lines in the interspaces, doubled in the submedian space; cross-lines brown, faint, not dotted, inner from near apex to inner margin near base, outer from apex to inner margin near middle; a small blackish discal dot. Hind wing white. Expanse, 16 mm.

Type, male, No. 21127, U. S. Nat. Mus.; Audubon Park, Louisiana, September 25, 1914 (U. C. Loftin), at light.

Chilo opinionellus, new species.

Grayish straw-color, the veins narrowly straw-color; costa straw-color; a gray shade through the cell and outward to

margin; a rather large rounded black discal dot; a row of minute terminal black dots between the veins; fringe interlined. Hind wing gray, a little lighter at extreme base. Expanse, 16 mm.

Type, male, No. 21180, U. S. Nat. Mus.; Yuma, Arizona, July 24, 1916, bred from larvæ in wheat stems (T. D. Urbahns).

Chilo loftini, new species.

Apex of fore wing acute; whitish straw-color, the veins light, edged on each side by a line of fine brown scales, which diffuse in the interspaces; a small black discal dot; a row of terminal black dots in the interspaces, connected by a slender line; fringe interlined with brown. Hind wing white with a slender brown line on apical half. Expanse, 23 mm.

Type, female, No. 21128, U. S. Nat. Mus.; Glendale, Arizona, September 1, 1914 (U. C. Loftin), bred from Mexican cane.

The male is much smaller, expanse, 15 mm. Other specimens were bred from Louisiana cane, in the same locality.

The species is allied to *C. multipunctellus* Kearfott, but is not as white and is more distinctly and clearly marked. It looks very much like *Platytes densellus* Zeller, but the front is strongly tuberculate, which is not the case in that species.

Platytes dinephelalis, new species.

Fore wing white, the costa and inner margin broadly shaded with creamy brown, shading to dark brown just before the white area, appearing as two brown clouded bands, one through the cell, curving up to apex, the other along submedian fold; scattered brown scales over the wings; veins narrowly and not prominently lined in brown; a minute black discal point.

Hind wing brownish gray, whitish at base. Expanse, 29 mm.

Type, male, No. 21139, U. S. Nat. Mus.; Babaquivera Mountains, Pima County, Arizona (through Dr. William Barnes).

A female, returned to Dr. Barnes, is the same, except that the discal dot is larger and the hind wing nearly white.

Platytes acerata, new species.

White; fore wing with the veins narrowly black lined; broad brown bands in the interspaces, that in interspace 5-6 pale brown; discal dot round, black; a row of terminal black dots in the interspaces; an oblique line starting from the costa above discal dot, running out to the fork of veins 8-9; fringe faintly interlined with brown.

Hind wing distinctly emarginate below apex, white; veins at apex touched with dusky and a terminal gray line on upper half of wing. Expanse, 15 mm.

Type, male, No. 21147, U. S. Nat. Mus.; Dade City, Florida, September (J. A. Grossbeck).

A female before me differs in having an irregular broken outer line, brown, strongly excurved over cell and angled on submedian fold.

Florida (Schaus collection).

Other specimens, apparently referable here, are labeled as follows: One male, without abdomen, "From Texas, Boll," "12 VI," "583," "I do not know this species. Rag./86, white label 137," "Coll. C. V. Riley," "*Chilo densellus*, Fernald det.;" a male and female, unset and not fresh, Brownsville, Texas. June, 1904 (H. S. Barber), and a second female, set, with the same collecting data, but further labeled, "*Chilo densellus* Zell., named by Kearfott, 1908."

Platytes densellus Zeller has the veins white-lined, not black-lined. It is curious that this obvious distinction should have escaped two generally accurate authors.

Platytes panalope, new species.

Fore wing pale straw-color, the veins narrowly lined with dark brown; fainter and broader brown lines in the interspaces. that in the interspace 5-6 very faint, causing the interspace to appear as a pale ray emanating from the cell; a small black discal dot; a row of terminal dots between the veins; an oblique brown line forms an angle on vein 2 at its basal third

and runs thence to the inner margin, faintly shown above across the discal nervules, crossing 3 and 4 and running into the interspace 4-5. Hind wing whitish on inner half, pale fuscous on costal half. Expanse, 19 mm.

Type, male, No. 21140, U. S. Nat. Mus.; East River, Connecticut, August, 1907 (C. R. Ely).

This species is peculiar in frequently having vein 10 stalked with 8 and 9. The stalking occurs by a fusion of 10 with the stalk beyond the base, so that a small triangular accessory cell is left. This occurs in five out of seven specimens before me. The other two have vein 10 free, although bent toward the stalk. The tongue is practically absent in the male, but quite distinct in the female.

Two other species of *Platytes* with dark-lined veins are known, *multilineatella* Hulst and *punctilineella* Barnes & McDunnough, both from Florida. They are both narrower-winged than *panalope*, darker and more uniform. In all these species, the hind wings of the female are white or, at least, paler than those of the male. Therefore I think that Hulst described *multilineatella* from two females instead of two males, as stated, since he describes the hind wings as pure white.

Haimbachia venosalis, new species.

Fore wing white, the veins broadly lined with chocolate brown, the interspaces with narrow lines of the same color, ending in small terminal black dots; a distinct black discal spot; fringe interlined. Hind wing white, the veins lined in brown at apex. Expanse, 17 mm.

Type, male, No. 21141, U. S. Nat. Mus.; Audubon Park, Louisiana, September 19, 1914 (U. C. Loftin), at light.

The female is the same, only a little larger, expanse, 21 mm. The tongue is absent in the male, but distinct in the female, which throws the species out of *Diatræa*. It resembles *Platytes multilineatella* Hulst in a general way, but veins 11 and 12 of fore wing anastomose, compelling the reference to *Haimbachia*.

SEVEN NEW PYRALIDS FROM BRITISH GUIANA

(Lepidoptera, Pyralidæ)

By HARRISON G. DYAR

Bocchoris plenilinealis, new species.

Straw-yellow; a brown point on vertex of head, two on collar, a dot and streak on patagia; abdomen with basal segmental bands, widening on the sides, the last two segments with dorsal black patches. Wings with brown lines, appearing numerous; a dot on costa and vein 1 near base; two dots on inner margin with a blotch above and a subcostal dot; inner line oblique, single; orbicular a pair of bars, the outer bar joining an inverted looped line below; reniform a pair of bars, constricted, filled with darker yellow, the inner bar touching the looped line below; outer line curved, running to inner margin at middle, stout from costa to vein 5, fine and dentate on 3 and 4, slightly dislocated on 2, along which runs a stout line to termen; an excurved branch at vein 5, denticulate, subparallel and reaching inner margin at its outer fourth; a subterminal denticulate line, not attaining costa and ending at vein 2; veins 5, 6, and 7 dark-lined between the outer and subterminal lines; a terminal line, dentate on the veins; fringe dark, submetallic.

Hind wing with the reniform of two bars, with two lines thence to anal angle, the outer one angled at vein 1; outer line double, excurved between veins 3 and 5, single below vein 2; subterminal line from costa to vein 2; terminal line double. Expanse, 18 mm.

Type, female, No. 21129, U. S. Nat. Mus.; Plantation Uitolugt, Georgetown, British Guiana, January, 1915 (H. W. B. Moore), bred from larvæ on young leaves of cacao. Other specimens are before me from Cayenne, French Guiana, February, 1904 (W. Schaus); Geldersland, Surinam River, Dutch Guiana (W. Schaus); Santiago, Cuba, June and October, 1902 (W. Schaus).

Near *B. stigmalis* Hampson, but the color yellower, the lines much finer and differently disposed.

Nacoleia veroniæ, new species.

Head large; antennæ of male with a tuft beyond the middle; thorax whitish, with illy defined brown markings; abdomen shaded with gray; fore wing with the margin incised below apex and way; white, with brown markings; a brown patch at base; a broad band at inner third, constricted in the middle, lighter centrally, the upper section centered by a minute white orbicular point; a very fine line preceding the band and another following it below and along the median vein; a triangular blotch across end of cell, lighter centered, touching the outer line at vein 3; outer line slender, regularly curved, oblique below; subterminal line connecting a blotch at apex with one at tornus; a fine terminal line; fringe white with brown bars at apex, vein 7, 4, and 5.

Hind wing excised below apex as on fore wing; white, with small brown marks at base; a band across middle, yellow centered on discal dot and vacuolated thence to inner margin, sending a spur from cell to outer line; outer line nearly straight; apex broadly blotched with brown, widened at the incision, narrowed below to a line; a terminal line just beyond; fringe with dashes as on fore wing. Expanse, 11 mm.

Type, male, No. 21130, U. S. Nat. Mus.; Plantation Kitty, Georgetown, British Guiana, December, 1913 (H. W. B. Moore), bred from larvæ on *Veronia curassavica*.

Allied to *N. subulalis* Guenée, but much smaller and differently marked.

Pyrausta interlinealis, new species.

Thorax brownish ochereous, tinged with reddish; fore wing ochereous, with dull reddish markings; costa broadly of this color, the extreme edge white; all veins and lines in the interspaces dull reddish; inner line scarcely traceable; orbicular a point; reniform a curved lunule; outer line excurved above, dentate on the veins, rather broad.

Hind wing straw-color, darker along the margins; a segment of a grayish outer line, seen only between veins 2 and 7. Expanse, 26 mm.

Type, female, No. 21131, U. S. Nat. Mus.; Plantation Kitty, Georgetown, British Guiana, June, 1915 (H. W. B. Moore), bred from larvæ on vervain (*Stachytarpheta* sp.).

Herculia psammioxantha, new species.

Brownish straw-color, densely dusted with fine brown scales; lines straight, parallel, erect; a faint discal dot, often absent; outer line faintly edged with pale.

Hind wing with two dark lines, approximating toward inner margin, faintly pale edged, the inner toward base, the outer outwardly; outer line originating not far from middle of costa, reaching inner margin at its outer fourth. Expanse, 16 mm.

Type, male, No. 21132, U. S. Nat. Mus.; Plantation Vryheid's Lust, Georgetown, British Guiana, August, 1915 (H. W. B. Moore), bred from larvæ on withered, fallen leaves of trumpet tree. Other specimens are before me from Cayenne, French Guiana, January, 1904 (W. Schaus); Santiago and Matanzas, Cuba, June and August, 1902 (W. Schaus).

The female is larger, expanse, 17-20 mm.

Pococera chrysoderas, new species.

Head, thorax, and abdomen white, washed with yellow-brown; abdomen posteriorly with broad black apical segmental rings; fore wing with a pale ocherous bar along inner margin to middle, sharply cut by the inner line; two black bars above this; costal area brownish with a black mark in the cell; inner line at middle of wing, erect, straight, black, running into the small white discal dot, inbent on costa; outer half of wing gray in median space, thence shading blackish to margin; outer line excurved centrally, black, single, dentate on the veins; a terminal thick black line, cut by whitish on the veins.

Hind wing brownish yellow at anal angle, apex broadly blackish, veins dark; fringe diffusedly interlined. Expanse, 22 mm.

Type, female, No. 21133, U. S. Nat. Mus.; Plantation Golden Fleece, Georgetown, British Guiana, June 7, 1915 (H. W. B. Moore), bred from larvæ on an unidentified shrub growing on the sand hills.

Emporia cassiæ, new species.

Dark gray, the markings obscure; a slightly oblique, broad, black band from costa to median vein represents the inner line; median vein and branches black-lined; discal dots small, separate; outer line strong on costa, double, oblique and denticulate below, the duplication not following it, but running parallel to outer margin; a row of terminal black dots; fringe slightly reddish.

Hind wing white, broadly gray on costa and narrowly on outer margin; fringe slightly reddish. Expanse, 19 mm.

Type, female, No. 21137, U. S. Nat. Mus.; Plantation Rose Hall, Georgetown, British Guiana (H. W. B. Moore), bred from larvæ in pods of "stinking toe" (*Cassia grandis*).

No species of *Emporia* has been recorded before from America; but the present form fits the generic description so well as to make a new name seem superfluous.

Eumoorea, new genus.

Fore wing with eleven veins; vein 2 from well before end of cell, 3 from shortly before end, 4-5 long-stalked, 6 below apex of cell, 7-8 stalked, 9 absent, 10 from the cell close to the stalk of 7-8 in two specimens, stalked in two others, 11 from the cell; hind wing with seven veins, 2 from end of cell, 3 and 5 stalked, 4 absent, 6 from apex of cell, 8 distinct. Palpi thick in the male, obliquely ascending, the third joint porrect, hollow to receive the pencil-tufted maxillary palpi; long, straight, and porrect in the female, three times the length of head. Antennæ in the male with a long thick basal joint, the shaft ciliate.

Falls near *Emmalocera* Ragonot, but vein 4 of hind wing is absent.

Named in honor of Mr. Harold W. B. Moore, who bred all the species here described.

Eumoorea anchridis, new species.

Fore wing rosy pink; a thick washing of white scales through the cell, which runs out along the subcostal and discal venules; a terminal row of small black dots.

Hind wing soiled whitish with terminal gray line. Expanse, 18 mm.

Type, male, No. 21138, U. S. Nat. Mus.; Plantation Uitolugt, Georgetown, British Guiana (H. W. B. Moore), bred from larvæ on arrow-grass (*Anchris bicornis*).

NEW AUSTRALIAN CHALCID-FLIES

(*Hymenoptera, Chalcididæ*)

By A. A. GIRAULT

Coccophagus leptospermi, new species.

Female.—Length, 0.90 mm. In the analysis of species in the Memoirs Queensland Museum, IV, runs to *triguttatus* and is like that species. Golden yellow, the wings hyaline, the body marked with black as follows: Upper face of prothorax, pronotum, cephalic margin of scutellum narrowly, caudal margin of propodeum across the meson narrowly and five narrow stripes across the abdomen, the first at base and thickest, the fifth curved and some little distance from apex. Club distinct, somewhat wider than the funicle, its joints not longer than wide, 2 distinctly wider than long; funicle 3 subquadrate. 2 a little longer than it, 1 a half longer than wide; pedicel subequal to funicle 2. Mandibles tridentate. Distal tarsal joint black. Funicle and club armed with slightly thickened, black setæ; scutum with numerous, scattered, short, black setæ, the scutellum with only a few long setæ. Marginal vein somewhat shorter than the submarginal.

Male.—Marked with black as follows: Abdomen, propodeum, caudal part of mesopleurum, the large diamond-shaped axillæ, a smaller yet conspicuous triangle at base of middle of scutellum (at base joined to the black axillæ), cephalic half of scutum except very broadly along lateral margin, pronotum and face of prothorax, upper half of occiput and a dot on cephalic parapside at mesal margin. Funicle and club dusky; pedicel minute; funicle 1 twice longer than wide (with two rows of the black setæ), 2 and 3 shortening slightly in succession; club as in the female but narrower.

From many pairs reared from galls on *Leptospermum flavescens*, September, 1915 (H. Hacker). From Dr. R. Hamlyn-Harris.

Habitat: Brisbane, Queensland and as above.

Types: In the Queensland Museum, Brisbane, four males, nine females on a slide. *Cotypes*: Cat. No. 20668, U. S. Nat. Mus., one male, seventeen females on a slide.

Resembles *magniclavus* Girault from the West Indies.

Coccophagus pulliclavus, new species.

Female.—Length, 0.60 mm. Deep uniformly reddish orange, the fore wings uniformly lightly infuscated. Antennæ dusky, the club dark brown, the upper face of prothorax black. Club well-defined but barely wider than the funicle, its first two joints subequal, each somewhat longer than wide, 3 nearly twice longer than wide. Pedicel slightly shorter than club 1. Stigmal vein foot-shaped, subsessile. Fore wing about as in *Aphelinus fuscipennis* as to shape, but the marginal fringes are somewhat longer. Hind wings with about seven lines of discal cilia, their caudal marginal cilia longer than the blade's greatest width. Mandibles weakly tridentate. Body densely scaly. Venation yellow, the marginal vein a little longer than the submarginal.

Two females in the U. S. National Museum (G. Compere).

Habitat: Perth, West Australia.

Type: Cat. No. 20669, U. S. Nat. Mus., one female on a slide. *Cotype*: In the Queensland Museum, Brisbane, a female on a slide.

PARAMYIOCNEMA, new genus

Genotype: *Myiocnema marmorativentris* Girault.

Differs from *Encarsia* in having the caudal tibia dorsad armed with long, stiff bristles.

Bardylis australiensis Howard.

In the male, funicles 1–3 are subequal. As described originally. The vertex is orange. The hind femora are often brown black. There are specimens in the U. S. National

Museum from Suva, Fiji, from *Mytilaspis* on an *Euphorbia* (?) in a salt marsh (A. Koebele, 1909). Types examined.

***Bardylis australicus*, new species.**

Female.—Length, 0.60 mm. Differs from the genotype as follows: Funicle 1 is cupshaped, no longer than wide at apex and a third shorter than 2, which is slightly longer than wide and slightly broader distad than proximad. Also, the caudal wings are broader, with about eight lines of discal cilia (4–5 in the other species). The marginal cilia of the fore wing are somewhat shorter.

One male, twelve females on a slide in the U. S. Department of Agriculture collections, reared from *Aspidiotus rossii*, *A. nerii*, and *Parlatoria proteus* on *Ficus*, Botanical Gardens, January, 1899 (A. Koebele).

Habitat: Sydney, New South Wales, and as above.

Types: Cat. No. 20670, U. S. Nat. Mus., the specimens as in the foregoing.

***Apterotrix dubia*, new species.**

Female.—Length, 0.50 mm. *Marginal vein subequal to the submarginal, thick, ending obtusely (or subtruncate), the stigmal obsolete.*

Black, the following parts golden yellow: Caudal and lateral margins of scutum, parapsides, scutellum, and extreme apex of the abdomen. Antennæ and legs pallid. Funicle joints small, 1 widening distad, its apex oblique, a little longer than wide, 2 small, wider than long, 3 the same but longer than 2; club well defined, 1 a little longer than wide, 2 and 3 subequal, each somewhat longer than 1, subequal to the pedicel, the latter longer than the funicle. Fore wings distinctly, lightly infuscated from base to apex of venation, narrow, their discal cilia numerous but not dense, minute, their longest marginal cilia a little over two-thirds their greatest width. Stigmal vein indicated by a slight curve away from the margin by the apex of the marginal. Caudal and middle tarsal joints subequal. Wings broadest across apex of the venation, like those of *Aspidiotiphagus* but the cilia are not as long. Ovipositor in-

serted distad of the middle of the abdomen. Middle tibial spur nearly as long as the first two joints of the tarsi united.

Seventeen females on a slide, "*Fiorinia* on *Acacia*. Parramatta, New South Wales, December 14, 1899, A. Koebele."

Habitat: As just given.

Type: Cat. No. 20671, U. S. Nat. Mus., the described specimens.

Cerchysius occidentalis, new species.

Female.—Length, 1.50 mm., excluding the ovipositor. Agrees with the description of *oviductus* but the fore wings bear a small yellow stain against the stigmal vein; of the legs only the tarsi, knees very narrowly, tips of middle tibiae (and of the valves of the ovipositor) are dull yellowish. Axillæ joined and with a minute carina between them. Marginal vein nearly twice longer than wide, subequal to the postmarginal which is a third shorter than the stigmal; about seven lines of coarser cilia proximad of the hairless line. Funicle 2 a little wider than long, 6 distinctly so, twice wider than 1 and somewhat longer than it. Hind tibial spur single.

Four females in the U. S. National Museum (G. Compere).

Habitat: Perth, West Australia.

Types: Cat. No. 20672, U. S. Nat. Mus., two of the above on tags plus a slide bearing a head, a hind leg, and a fore wing. Cotypes: Queensland Museum, two females on two tags.

A male found later bore antennæ like those of *oviductus* male. Female vertex scaly, with several rows of fine punctures on each side; scrobes forming a semicircle.

Cerchysius bellulus (Girault).

Copidosoma australiensis Girault.

Cerchysius australis (Girault).

Copidosoma australis Girault.

Genus CHEILONEUROIDES Girault

The genotype appears identical with that of *Diversinervis*. Three females from *Lecanium oleæ*, Brisbane, Queensland, April 2, 1900 (G. Compere). The abdomen was metallic

purple, also the dorsal pedicel and vertex, while the wings were as described.

Ceraptrocerus australia, new species.

Female.—Length, 1.39 mm. Dark metallic purple, the pronotum, vertex, and dorsal fourth of occiput bright orange yellow; tarsi, a narrow band on cephalic tibiæ just below the knee, tips of tibiæ, palpi and a cinctus on middle tibiæ, pale yellow; proximal and distal joints of caudal tarsi purplish. Venation black, the fore wing very deeply infuscated from base for two-thirds the way to apex from apex of the venation, the distal margin of the infuscation flatly convex (the apex of the wing thus broadly hyaline); a narrow, straight line in front of venation, a narrow, wavy line not far from the apex of the infuscation (both transverse), a longitudinal, narrow line not very far from caudal margin of the wing, its middle about opposite the apex of venation and a subquadrate area against apex of the submarginal vein, hyaline. Scutellum more coarsely scaly than the scutum, large, with a pair of setæ at its apex. Frons prominent, moderately narrow, the face greatly inflexed. Club obliquely truncate, longer than the funicle and as broad, the funicle joints annular, the first distinctly narrower than the others. Pedicel wider than long, crescentic. Third tooth of mandible more obtuse than the other two. Hind tibial spurs double. Marginal vein somewhat longer than the stigmal, the postmarginal shorter. Axillæ barely separated.

One female, forest at 500 feet, November 2, 1914.

Habitat: Hawkesbury River at Brooklyn, New South Wales.

Type: In the Queensland Museum, the female on a tag, head, fore wing, and a hind leg on a slide.

(To be continued.)

Date of publication, June 2, 1917.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar and
Frederick Knab. Price, \$2 a year in advance.

Subscriptions and matter for publication should be addressed to Harrison
G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the
manuscript.

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INSECUTOR INSCITIZÆ MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. V

JULY-SEPTEMBER, 1917

Nos. 7-9

Insecutor Inscitiae Menstruus

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THE MOSQUITOES OF THE PACIFIC NORTHWEST

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

In studying the mosquitoes of the Sierra Nevada Mountains of California in 1916, I was confronted by the problem of a certain similarity between *Aedes tahoënsis* of the Sierras and *A. pullatus* of the Rocky Mountain region of British Columbia and Idaho. The two differ in the number of larval head hairs, and it was thought that *tahoënsis* might extend up the Cascades through the Pacific Northwest to British Columbia, where the mountains meet, and so, the two species converge. Accordingly a short exploration was undertaken of the mountains in Washington State in the spring of 1917. Specifically, Glacier, in the Mount Baker region; Longmire Springs, in the Mount Rainier region, and Lake Cushman, in the Olympics, were visited.

Concerning the special problem in hand, it was determined that *tahoënsis* does not follow up the Cascades, but is replaced by an allied species, and therefore the geographical isolation of *tahoënsis* and *pullatus* is assured, together with their distinctness. This is quite clearly indicated by the very different climatic and floral conditions obtaining in the Sierras, as a short stay will readily convince one. In the Northwest it rains, producing a dense forest with moss and undergrowth; in California there is no rain, the forest being open and dry, while the lowland is treeless.

As compared with California, the Pacific Northwest is poor in mosquitoes, both in individuals and in the number of species concerned. But three black-legged species of *Aedes* were found

in the mountains instead of six as in California. This is again conditioned by the climate. Frequent rains are conducive to permanent pools in which *Aedes* do not thrive. The *Culex*, *Culiseta*, and *Anopheles* that do frequent such places are the same as in California, minus the tropical element, but without any additional species, all resulting in a small mosquito fauna.

***Aedes aloponotum*, new species.**

Mesonotum light red, with three narrow dark brown lines in the integument; vestiture of narrow curved bronzy brown scales, becoming straw-color about the antescutellar space. Abdomen black, with basal segmental whitish bands, widening at the sides; venter with median black patches almost forming a band. Wing-scales black, with white ones intermixed on costa and first vein, some also on forks of second and fourth veins. Legs black; femora white within nearly to tip, a white knee-spot; tarsi with broad basal whitish rings, the last joint half white. Claws toothed.

Type, female, No. 21543, U. S. Nat. Mus.; Lake Cushman, Washington, June 28, 1917 (H. G. Dyar).

Two other females were taken at the same place; one has the integument of the mesonotum dark brown, but with the same foxy-red vestiture.

A peculiar species of the *cantans* group. Male and early stages unknown.

***Aedes increpitus* Dyar.**

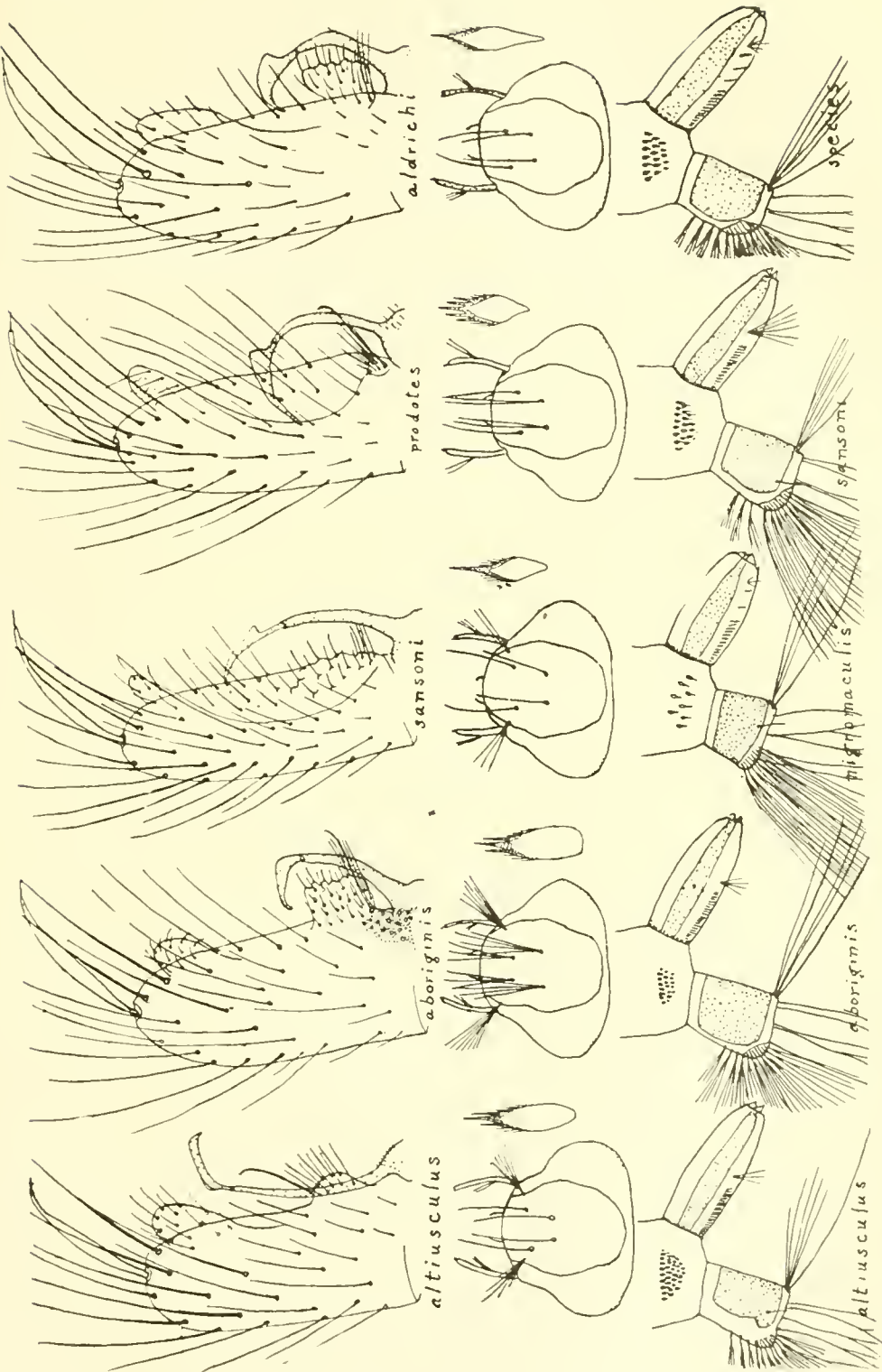
A single female taken at Lake Cushman, Washington, June 27, 1917, is referred to *increpitus* pending further information.

***Aedes curriei* Coquillett.**

A coast species breeding in tidal pools, not distinct from the inland *curriei*. A specimen was seen on the marsh at Bellingham, Washington, May 31, 1917, and others were captured at Alki Point, Seattle, Washington, June 20, 1917.

***Aedes cinereus* Meigen (*fuscus* Osten Sacken).**

A larva was found at Glacier, Washington, and bred to adult, June 13, 1917. Male adults were taken at Lake Cushman, June 26, 1917.



DETAILS OF GENITALIA AND LARVAE OF AËDES

Aedes varipalpus Coquillett.

The western tree-hole species occurs both in lowland and the mountains. Specimens have been recorded from Seattle in the monograph and I met with it commonly at Lake Cushman, in the Olympics. A larva was found at Longmire Springs, June 11, in water in a sawed-off stump.

Aedes aboriginis, new species.

Head and mesonotum with dark yellow or brownish yellow narrow curved scales; a double line of small dark brown ones dorsally; traces only of the posterior lateral lines; area around antescutellar space golden. Abdomen black with basal segmental narrow white bands, triangularly widened at the sides, narrow posteriorly; venter grayish white scaled, with traces of a medioventral black stripe. Legs black, femora whitish beneath nearly to tip; tibiæ with a sprinkling of gray scales; knee-spot white. Wing-scales black, the scaling uniform, fine outstanding scales on the third vein like the rest.

In the male, the medioventral stripe of the abdomen is distinct, crossed by apical segmental black bands.

Genitalia (See Plate II). Apical lobe of sidepiece small, with slightly curved, partly appressed setæ; basal lobe large, expanded, tubercular, setose, the setæ very long and dense on the lower edge, concealing a moderately stout curved spine, not longer than the setæ. A thickened area between basal lobe and base, punctured by the insertions of small setæ. Stem of harpago moderate, the filament rather short, fusiform, with pointed curved tip. This is essentially as in *hexodontus*.

Larva (See Plate II). Scales of the lateral comb about 20, each with a row of apical spines. Air-tube with the pecten evenly spaced, followed by a 5-haired tuft. Anal segment not ringed by the plate, the plate reaching near the ventral line and evenly margined. Head hairs: Upper in threes, rarely fours; lower in threes, rarely in twos. Ante-antennal tuft of eight.

Types, male and female, No. 21544, U. S. Nat. Mus.; bred from larvæ found the middle of June, in the last stage, but with few pupæ, in temporary puddles on the marsh and in woods-pools near the marsh, Longmire Springs, Mount

Rainier National Park, Washington, issued June 17 to July 1, 1917 (H. G. Dyar).

Adult females, Glacier, Washington, June 3, 1917 (H. G. Dyar), and females and males, Lake Cushman, Washington, June 26, 27, 28, 1917 (H. G. Dyar); Hoquiam, Washington, May 27, 1904 (H. E. Burke), the latter erroneously recorded under *hexodontus* by me (Ins. Insc. Mens., v, 14, 1917); old specimens of this, the larger species, Ashford, Washington, August 1, 1906 (Dyar & Caudell).

The males were observed swarming at Lake Cushman in small groups in the forest in the forenoon, bright sunlight shining through the trees, but well screened by the dense foliage. The swarms were on the dark side of the trunks of enormous cedar trees, in one case growing upon a rocky bank, which added to the shadow. The swarms were from 6 to 10 feet from the ground, varying from a few to 50 individuals.

Aedes altiusculus, new species.

Head and mesonotum as in *aboriginis*, the color a little less yellow, more creamy. Abdomen black, with rather broad basal segmental white bands, triangularly widened on the sides; venter white, with narrow apical segmental black bands. Wings and legs as in *aboriginis*.

Male with the venter gray-white scaled, narrow apical segmental black bands and no trace of medioventral line.

Genitalia (See Plate II). Apical lobe of sidepiece large, with long straight setæ; basal lobe expanded, setose, a long stout seta on the outer (dorsal) side. Stem of harpago long, the basal part curved and minutely pilose; filament sickle-shaped with double dorsal membranous ridge. This is essentially as in *tahoënsis*.

Larva (See Plate II). Lateral comb of the eighth segment of about 36 scales, each scale with a row of apical spines. Anal segment not ringed by the plate, which reaches only the middle of the side and terminates in a ragged edge; lateral hair single. Air-tube with the pecten evenly spaced, followed by a 6-haired tuft. Head hairs single, long and stout, approximate; ante-antennal tuft of nine.

Types, male and female, No. 21545, U. S. Nat. Mus.; "Indian Henry's," Mount Rainier National Park, Washington, larvæ June 13, 1917, in a mountain meadow. Old specimens of this small species, Mount Rainier, Washington, August 3-4, 1906 (Dyar & Caudell).

I owe the discovery of this species to Mrs. W. P. Allen, my faithful nurse, and Mr. J. B. Flett, Forest Ranger in the Mount Rainier National Park. Undaunted by the rain and soft snow, these indefatigable people tramped up 1,300 feet of altitude to Indian Henry's, only to find the whole meadow deep in snow. However, they searched for a wet place, and, finding it, scooped out the freezing mixture with their hands. Their perseverance was rewarded by some 20 larvæ of *altiusculus*, in the first stage, which were kicking about in the water under the snow.

I would express my obligation to both Mrs. Allen and Mr. Flett for their kindness in making this arduous ascent, which I was prevented from undertaking personally by physical disability.

Culiseta impatiens Walker.

This large mosquito is common in all the mountain regions. Adults: Glacier, June 3; Longmire Springs, June 11; Lake Cushman, June 26. Larvæ at Lake Cushman in a dark pool in the forest, in considerable numbers, preyed upon by a flock of larvæ of *Eucorethra*.

Culiseta incidens Thomson.

Everywhere in the lowlands, absent from the mountains. Hoquiam, May 27; Centralia, May 28; Bellingham, May 31; Ashford, June 10; Seattle, June 22, 1917.

Culex tarsalis Coquillett.

Abundant in the lowlands. Centralia, May 28; Bellingham, May 31; Tacoma, June 16; Seattle, June 22, 1917.

Culex saxatilis Grossbeck. (*territans* Auct.).

Larvæ, presumably of this species, were found in woods pools of permanent water, Glacier, Washington, June 2, 1917. An adult was captured at Sumas, Washington, June 2, 1917.

Anopheles occidentalis Dyar & Knab.

Anopheles larvæ were common in protected spots around the shores of Lake Whatcomb, Bellingham, Washington, May 31, 1917. The specimens were not bred, having been accidentally left behind on a train in the hurry of making a quick connection, but are presumably of this species.

**NOTES ON AEDES AT LAKE PEND D'OREILLE,
IDAHO**

(*Diptera, Culicidæ*)

BY HARRISON G. DYAR

A brief stop was made, July 3-4, 1917, at Sandpoint, on Lake Pend d'Oreille, and a trip taken to Sunnyside, an hour's ride down the lake. The altitude is 2,096 feet above sea level. The country is mountainous and well forested with conifers down to the lake margin. The following species of *Aedes* were taken:

Aedes aestivalis Dyar.

Seventy-three females and twenty-eight males. The mesonotum is whiter than in typical *aestivalis* from Kaslo, British Columbia, only a few being of the yellow color. This was noticeable to the naked eye, for when the mosquitoes would alight on dark clothing at dusk they looked like little flakes of cotton. Under a lens, most are ash gray with a broad central brown stripe, rarely narrowly divided on mesial line. There is a sprinkling of white scales on the wing along costa and subcostal vein.

The genitalia as described in the monograph (vol. iv, p. 742) should be slightly corrected. The basal lobe of the sidepiece is not accompanied by a stout hooked spine, but by a group of stiff setæ the outmost of which is thickened and has a large insertion, the spine not being fully differentiated as our description implies. The filament of the harpagone should be described as angularly widened near base. The apical lobe of the sidepiece is sparsely setose, being bare only at the tip on

the under side, which shows only in strongly appressed mounts. The genitalia, therefore, are as in *hirsuteron*, *idahoënsis*, *spencerii*, and *aldrichi*, these species having genitalia of the same type. Indeed, the adults are similar, all having the same coloration of the legs and mesonotal marking, which is subject to variation. In *idahoënsis* and *spencerii* the wing scales are parti-colored as befits a prairie life; in the other three they are black, as suits the forest. Not improbably these species are recently evolved and not fully separated where their localities adjoin. Their general regions are well marked; *aestivalis* in the forests of the Rocky Mountains; *hirsuteron* in the southern Atlantic region; *spencerii* in the prairies of Canada; *idahoënsis* in the river prairies of Nevada, Idaho, and Montana; *aldrichi* in the river bottoms with *idahoënsis*.

***Aëdes idahoënsis* Theobald.**

One female.

***Aëdes cinereus* Meigen (*fuscus* Osten Sacken).**

One male and three females.

***Aëdes canadensis* Theobald.**

Three females.

***Aëdes vexans* Meigen (*sylvestris* Theobald).**

Nine males and four females.

***Aëdes sansoni* Dyar & Knab.**

One male and sixteen females. The male is *sansoni*, as determined by the genitalia; but *abfitchii* Felt & Young¹ may also occur. At Kaslo, British Columbia, on Kootenai Lake, of essentially the same fauna as this, *abfitchii*¹ was determined. I think both will be found, as lake pools should develop *sansoni*, while *abfitchii*¹ comes from marshes, for which there is opportunity at Sandpoint.

In comparison with the Kaslo list (Proc. Ent. Soc. Wash., vi, 37, 1904), the following *Aëdes* were there noted:

Aëdes pullatus Coquillett (as *impiger* Walker).

Aëdes abfitchii Felt & Young¹ (as *cantans* Meigen).

¹This should be called *A. mimesis* Dyar. See my remarks under this heading in a paper on the *Aëdes* of Montana, which follows.

Aedes aestivalis Dyar (as *reptans* Meigen).

Aedes canadensis Theobald.

Aedes trichurus Dyar (as *punctor* Kirby).

Aedes vexans Meigen (as *sylvestris* Theobald).

Aedes varipalpus Coquillett.

Aedes curriei Coquillett.

Aedes spencerii Theobald.

Aedes cinereus Meigen (as *fuscus* Osten Sacken).

The smaller number of species at Lake Pend d'Oreille is partly accounted for by the brief time devoted to collecting, the early forms, *pullatus* and *trichurus*, having probably disappeared. *A. curriei* and *spencerii* are strays at Kaslo, as is *idahoënsis* at Sandpoint. The tree-hole species, *varipalpus*, may be locally present at Lake Pend d'Oreille. Aside from these, the lists are identical.

NOTES ON THE AEDES OF MONTANA

(*Diptera, Culicidæ*)

BY HARRISON G. DYAR

A brief report on the mosquitoes of Montana is given in the Fourteenth Annual Report of the State Entomologist of Montana, December, 1916, by J. R. Parker. He lists (omitting *Culex*, *Culiseta* and *Anopheles*):

Aedes curriei Coquillett, the most abundant species.

Aedes sylvestris Theobald, the next in abundance.

Aedes nigromaculis Ludlow, the third in abundance.

Aedes spencerii Theobald, the fourth in abundance.

Aedes pullatus Coquillett, in timber at high altitudes.

NOT COMMON

Aedes campestris Dyar & Knab.

Aedes fletcheri Coquillett.

Aedes stimulans Walker (group).

Aedes idahoënsis Theobald.

Aedes hirsuteron Theobald.

Aedes fuscus Osten Sacken.

A cursory passage of the State reveals certain additional information, which is here noted.

The writer passed through Montana by the Northern Pacific Railroad, and made a few stops for collecting. The course of the railroad is as follows: Entering Montana on the west from the northern spur of Idaho, it follows up Clark's Fork of the Columbia River, passing beyond the entry of the Flat-head River, and crosses the divide of the Mission Range at (1) Evaro, (3,971 feet); proceeding downward by a sharp grade into the valley of the Hell Gate River, (2) Missoula (3,323 feet) is reached; the road then follows up the valley of that stream to (3) Drummond (3,967 feet); a tributary of this same stream is followed practically to its source, whence the road rises sharply and crosses the Continental Divide at (4) Homestake (6,356 feet); it then descends into the valley of the Missouri River, passing (5) Whitehall (4,371 feet); thence it ascends a tributary of the Missouri, the Gallatin River, nearly to its source, passing (6) Bozeman (4,773 feet), well up in the narrower part of the Gallatin Valley; a low divide is crossed through the Gallatin Range and the road descends into the valley of the Yellowstone River, passing (7) Big Timber (4,094 feet) and (8) Laurel (3,311 feet). No stops were made after Laurel, the road following the same valley as it widens into the plains, almost to the eastern border of Montana.

Unfortunately, no stop was feasible at Homestake (4), so nearly all the collections are from river valleys. The wooded mountains should yield other species, such as *Aedes pullatus* and *trichurus* as at Kaslo, British Columbia, and *Aedes aestivalis*, as at Sandpoint, Idaho. This forested mountain region connects along the Coeur d'Alene-Bitterroot chain with the main Rocky Mountains, and the mosquitoes mentioned not improbably follow into western Montana. Indeed, Parker lists two of them, namely, *pullatus* and *hirsuteron* (= *aestivalis*).

Disregarding the high forested regions and the sparsely wooded mesas and hills, and referring only to the river valleys, the following conditions appear: Mosquitoes are naturally abundant and certain species have been evidently much increased in numbers by artificial conditions. Five species were

observed to be able to take advantage of these, by breeding successfully in pools produced by irrigation. While originally these forms were doubtless confined to a single annual generation following the spring snows, now they breed as often as the obliging farmers furnish suitable pools. These species are: *Aedes curriei*, *nigromaculis*, *vexans*, *trivittatus* and another referred to under *spencerii* below.

The river valleys furnish two faunal areas, one the river bottom itself, wooded, often densely clothed with cottonwood and willow; the other the high flood-plain, destitute of trees and resembling a prairie. Characteristic of the latter region are *Aedes curriei*, *nigromaculis*, and *idahoënsis*. *A. vexans* also invades it, though commoner in the river bottom. The habits of *trivittatus* are probably similar to those of *vexans*, although being a rarer species, specimens were captured only by the river, though bred from prairie pools. The males of *curriei*, *nigromaculis*, and *idahoënsis* swarm on the prairie; *vexans* only by the river; the swarming of *trivittatus* was not observed.

Exclusively river-bottom species are: *Aedes aldrichi*, *cine-reus*, and *sansoni*. *Aedes campestris* and *fletcheri*, listed by Parker, were not taken by me. Parker does not indicate the localities where he found them. Both are prairie species.

THE LOCALITIES

(1) **Evapo**, 3,971 feet. In spite of the comparatively low elevation, this has much the character of a mountain meadow, a typical breeding place for the early snow-water species. A flat marshy area, draining in both directions, is surrounded by hills clothed with pine forest. When visited, the season was far advanced; not only had all breeding of the early species ceased, to be replaced by larvæ of *Culex* and *Culiseta*, but the mosquitoes themselves were nearly gone. Only seven specimens were found in a day's collection, though earlier they must have been numerous, as was stated to have been the case by the station agent.

Aedes idahoënsis Theobald. One female.

Aedes sansoni Dyar & Knab. Two females. Not certainly

determinable by the adults alone. I would have expected *mimesis*, which occurs at Kaslo, British Columbia, to the northward of this region, and the character of the breeding ground—marshes—indicates this species rather than the river-pool *sansoni*; but the wing scales are as in *sansoni*.

Aedes pullatus Coquillett. Two females. A large species of the black-legged group, the mesonotum clothed with dark brown scales without dark bands, the wing-scales black. This does not agree well with *pullatus*, but in the absence of full data I do not venture to separate it.

Aedes aestivalis Dyar. Two females. A smaller species of the black-legged group with gray lateral vestiture on the mesonotum. Both specimens are worn and in too poor shape for exact determination; but as *aestivalis* abounds at Sandpoint, Idaho, in a not wholly dissimilar region, the determination is made tentatively.

(2) Missoula, 3,223 feet. Situated in the broad prairie flood-plain of the Hell Gate River at the junction of two forks. The plain is surrounded by high hills, mostly bare of trees on their aspect toward the town, but wooded on the northern slopes toward the river canyon.

Aedes idahoënsis Theobald. Eighty-seven males and fifty-three females. Of the latter 20 are atypical, having the black and white scales on the wings not contrasting, though some are at least pale, and so transitional toward *aldrichi* Dyar & Knab.

Aedes vexans Meigen (*sylvestris* Theobald). Eight males and fifty-seven females.

Aedes sansoni Dyar & Knab. Twenty-four males and forty-seven females.

Aedes cinereus Meigen (*fuscus* Osten Sacken). Five females.

Aedes triseriatus Say. One female.

Aedes sp. One female with black legs and black wing-scales, possibly a specimen of *pullatus* strayed from the forested hills above. The specimen is badly rubbed. It was taken in Reno Park in the well-forested river bottom.

A pool was found by the river, filled by waste water coming through the railroad track, which contained many pupæ and a few larvæ of *sansoni*, *vexans*, and *cinereus*.

(3) **Drummond**, 3,967 feet. Though practically of the same altitude as Evaro (1), this place has the characteristics of a river-valley locality. There is a broad flood-plain without trees where the town is situated. A short walk brings one to the river, which has many overflow pools and channels, for the most part lined with low willow bushes. One day's collecting was spent here, entirely in the river bottom.

Aedes spencerii Theobald. Three females.

Aedes idahoënsis Theobald. One male, 68 females. Of the latter, 3 transitional toward *aldrichi* and one toward *spencerii*.

Aedes vexans Meigen. One male and 50 females.

Aedes sansoni Dyar & Knab. One male and 100 females.

Aedes mimesis Dyar. Two males and 25 females.

Aedes cinereus Meigen. Eighty-nine females.

Aedes canadensis Theobald. Thirty-one females.

Aedes curriei Coquillett. Eighteen females.

Aedes sp. One female with black legs, too much rubbed for determination.

(4) **Homestake**, 6,356 feet. On the crest of the divide. The mountain slopes to the west both steep and dry; but on the east the descent is more gradual and there is opportunity for breeding pools. Interesting species should occur.

(5) **Whitehall**, 4,371 feet. Of the same general character as Drummond (3). The flood-plain is well marked and treeless, the river bottom clothed with low willow bushes. Collections were made both on the prairie and river bottom.

Aedes idahoënsis Theobald. Ten males and 110 females. Of the latter three intermediate toward *aldrichi* and six toward *spencerii*.

Aedes vexans Meigen. Four males and 83 females.

Aedes sansoni Dyar & Knab. Nine females.

Aedes mimesis Dyar. Four females.

Aedes cinereus Meigen. Two females.

Aedes curriei Coquillett. Forty-six females.

Aedes nigromaculis Ludlow. Thirty-six females.

(6) **Bozeman**, 4,773 feet. This is situated toward the head of a valley. The prairie is undulating, while the river is small. A considerable area of valley is covered with dense bushes of *Crataegus* and dwarf poplar.

Aedes idahoënsis Theobald. Twenty males and 59 females, the latter all typical.

Aedes vexans Meigen. One female.

Aedes sansoni Dyar & Knab. One hundred and eighty females.

Aedes mimesis Dyar. Four females.

Aedes cinereus Meigen. Four females.

Aedes canadensis Theobald. Ten females.

Aedes nigromaculis Ludlow. One female, small and lightly colored.

(7) **Big Timber**, 4,094 feet. The town is on the edge of the prairie, whence one descends a rather steep hill to the river bottom. This latter is wide, with many dead channels and marshes, covered with willow bushes and groups of tall cottonwoods. From the latter the place gets its name. Collecting was done both on the prairie and in the river bottom.

Aedes idahoënsis Theobald. Ninety-eight females, of which 6 intergrade toward *aldrichi*.

Aedes aldrichi Dyar & Knab. Twelve males and 184 females.

Aedes vexans Meigen. Seventy-four females.

Aedes sansoni Dyar & Knab. Three females.

Aedes cinereus Meigen. Three females.

Aedes curriei Coquillett. Eight females.

Aedes nigromaculis Ludlow. Thirty-one females.

(8) **Laurel**, 3,311 feet. Farther down the Yellowstone Valley than Big Timber, the conditions intensified. The prairie is wide, the town situated a mile and a half from the river, while it is an equal distance to the sparsely pine-clad bluffs that border the valley. Irrigation is much resorted to. The river is large, with steep bank on one side, but low on the other, the bed enclosing low islands and forming marshes and dead channels. Collecting was done on both prairie and river bottom.

Aedes idahoënsis Theobald. Twenty-three males and 19 females.

Aedes aldrichi Dyar & Knab. Sixty females.

Aedes vexans Meigen. One hundred and fifty-six females.

Aedes cinereus Meigen. Five females.

Aedes curriei Coquillett. Forty-two males and 654 females.

Aedes nigromaculis Ludlow. Thirty-eight males and 726 females.

Aedes sansoni Dyar & Knab. One female.

Aedes trivittatus Coquillett. Thirty-eight females.

Aedes sp. One female. A black-legged species of large size, too much worn to identify.

Psorophora signipennis Coquillett. Three females.

A number of pools formed by seepage from irrigation ditches on the prairie contained larvæ and pupæ of *Aedes curriei*, *vexans*, *nigromaculis*, and *trivittatus*, of which 124 specimens were bred.

The above collections show relative abundance as follows: *A. nigromaculis* first with 832 specimens, *curriei* second with 768 specimens, *idahoënsis* third with 550 specimens, and *vexans* fourth with 434 specimens. It almost seems as if Mr. Parker must have accidentally transposed the labels on his determined *idahoënsis* and *spencerii*, for I got only two of the latter, while the former was one of the common species. Except for this discrepancy, I find the same species abundant as does Parker. The relatively different order is largely accidental. In a general way, *curriei* is the most widespread and abundant species. My collections were influenced by a local abundance of *nigromaculis* at Laurel. Similarly, *idahoënsis* is more abundant in western than in eastern Montana, and my collections plainly have a larger western proportion than Parker's, as I did not collect east of Laurel, which is near the middle of the State.

THE SPECIES

Aedes curriei Coquillett.

A widespread species, especially on the prairie. The coloration varies greatly. The males swarm over bushes or prominent objects. At Laurel, on the prairie, just at sunset, a

rapid swarm was observed in a low bush about three feet from the ground. It was netted and proved to be *curriei*. Half an hour later, when it was getting too dark to see distinctly, another group of males was seen in a taller bush (*Sarcobatus vermiculatus*), circulating among and over the top branches. They did not swarm over the writer's head, although some *idahoënsis* were doing so at the time, and as I approached the bush the two swarms became slightly mixed, though the *idahoënsis* were higher. Next evening I visited the same bush and observed two swarms over it. One was over the top of the bush and proved to be *idahoënsis*; the other a little to one side and below the top, on the lee side, was *curriei*. Also the same evening, in the open, a swarm gathered over my head, partly mixed with *nigromaculis*. In netting mosquitoes to avoid their bites one night in walking from the river to the town at Laurel, of about 600 specimens so caught three were males of *curriei*. They had evidently been swarming over my head.

As determined by Knab, the larvæ appear in the early snow pools on the prairie. In the presence of irrigation, however, other broods appear, probably every time favorable pools are formed. I establish the fact that eggs will hatch the same year as laid. At Reno, Nevada, I got *curriei* eggs from captive females, allowed them to dry, then added water in about ten days and a part of the eggs hatched. The water was poured off and the procedure repeated, when more eggs hatched. There is thus seen to be no physiological difference between *curriei*, the inland form, and *quaylei* of the Pacific coast, as was supposed. Both hatch whenever they get water.

The larvæ of *curriei* (Laurel, Montana) have the head hairs single like *quaylei* of the coast, and *onondagensis* of New York. The comb scales are evenly fringed with long spines, quite as in *quaylei*. In *onondagensis* there is a slight differentiation of the central spine, but not on all the scales. *Curriei* from Reno, Nevada, have single head hairs and a slight differentiation of the central spine of the comb scale.

Aedes campestris Dyar & Knab.

Recorded by Parker, the determination by Knab. This is

very close to *curriei*, differing principally in being slightly larger. There may be a few specimens among my 768 *curriei*, but I have not detected them and more probably *campestris* inhabits a different area from that traversed by me.

The two specimens differ in the male genitalia. Not as radically as given in the monograph, which should be corrected on this point, but sufficiently. In *curriei*, the basal lobe of the sidepiece has two spines, a large curved one centrally and a shorter straight one at the margin. In *campestris* the middle spine is straight and about as stout as the outer one in *curriei*, while the outer one is absent, being represented by two stout setæ. This is an unexpected divergence, since the two spines are present and of the same structure in *curriei*, *quaylei*, *onondagensis*, and even the European *dorsalis* Meigen, though somewhat approximate in the latter. In *campestris*, however, the type is altered.

Aedes canadensis Theobald.

Not found in the plains and in the river valleys only near the mountains. The species is characteristic of the northern Atlantic coast region, extending even to Florida. It ranges westward through Canada to the Rocky Mountains. The species is not recorded by Parker.

Aedes nigromaculis Ludlow.

This species is characteristic of the prairie section of the river valleys. It never comes into the timbered country. I did not encounter it west of the Great Divide.

The males form a loose active swarm above prominent objects on the prairie. On the evening of July 15, at Laurel, they gathered above the writer's head, rising to a great height when disturbed, gradually settling to two or three feet above the head. After half an hour the swarm became partly confused with a swarm of *curriei*, which gathered in a similar position, but lower. Another visit to the *Sarcobatus* bush mentioned above, after sunset, showed three swarms of males, *nigromaculis* above the bush high up, *idahoënsis* above but lower, and *curriei* low and a little to one side.

The egg is long, slender, spindle-shaped, a little flattened on one side, shining black, laid singly.

Eggs deposited about July 20 were allowed to dry and water was added on August 2. The larvæ hatched in considerable numbers within 15 minutes after the addition of the water. The habit is the same as with *curriei* and *trivittatus*, part of the eggs hatching whenever submerged, and overwintering is not necessary for emergence.

Consequently the larvæ occur in irrigation pools, frequently in large numbers. The larva (see Plate II) has the tuft of the tube far out, beyond the pecten which runs nearly to the end of the short tube; pecten with detached teeth outwardly; anal segment ringed by the plate; comb-scales seven to ten, in a patch, not in a line, the single scale with long sharp central spine and fringe of a few slender ones at base; head hairs both single, ante-antennal tuft in fours.

Aedes fletcheri Coquillett.

Superficially similar to *nigromaculis*, replacing it on the prairies of Saskatchewan and Alberta. The coloration is the same, but more yellowish in *fletcheri*, paler and suffused. There is no white ring on the proboscis, but this is also sometimes absent in *nigromaculis*. The species enters Montana at the northern part, as our single record proves, Big Fork, Flat-head County, 1904 (E. M. Ricker). Mr. Parker's specimen seems not to have been preserved in the collection. I did not meet with the species.

Aedes riparius Dyar & Knab.

A single specimen, Dillon, Montana, August 4, 1908 (R. A. Cooley), in the collection of the National Museum, agrees with this species. It is close to *fletcheri* in coloration, but differs in the abdomen, which in *riparius* is lightly suffused with whitish scales, in *fletcheri* strongly so. However, they differ in habit, *fletcheri* being a prairie species, while *riparius* frequents the timber along the river bottoms. I did not meet with this species. Dillon is in the Beaver Head valley, a tributary of the Missouri. The species ought, perhaps, to have been en-

countered by me at Whitehall, unless it frequents high timber, of which there was none at that place.

***Aedes sansoni* Dyar & Knab.**

The types of *sansoni* are five specimens, numbered, respectively, 10, 13, 14, 17, and 20 by the collector. Nos. 10, 13, and 14 are females, 17 and 20 are males. No. 20 is *Aedes curriei*, as shown by the genitalia. No. 17 has lost the abdomen, but has the sides of the mesonotum very white, as is also the case in the females, Nos. 13 and 14. No. 10 has the usual mixture of brown and white, the brown predominating, and may be selected as the type. The wings show a sprinkling of white scales along costa and subcostal vein.

A. sansoni was described from Banff, Alberta, a locality on a river flowing from the Rocky Mountains. In the monograph, we added certain other specimens, namely: Larvæ from Kaslo, British Columbia; a male from Juliaetta, Idaho; male and females from Eureka, California, and females from Fieldbrook, California. I have lately removed the California specimens to *increpitus* Dyar (Ins. Insc. Mens., v, 15, 1917). I now propose to remove the Kaslo larvæ. The larvæ agree with *abfitchii* essentially, and will be found referred to under the heading *mimesis* below. This will define *sansoni* as the river-pool species of the Rocky Mountain streams, and definitely associate the Banff female with the male from Juliaetta, Idaho. Males from Missoula, Montana, agree. Larvæ from Missoula are of the typical river-pool form (see Plate II), indistinguishable from *stimulans* Walker of the east or *increpitus* Dyar of California. The three species separate on male genitalia:

Basal lobe of sidepiece weak, tuberculate, sparsely setose, accompanied by a very strong spine.....*stimulans* Walker

Basal lobe of sidepiece tuberculate and diffused, without a strong spine.

Filament of harpago slenderly sickle-shaped, expanded at basal third (see Plate II).....*sansoni* Dyar & Knab

Filament of harpago with angular expansion beyond middle.

increpitus Dyar

A. sansoni was common in all the wooded river bottoms.

although, by the time I reached Laurel, they had become scarce and worn.

The egg is elliptical, rather thickly fusiform, a little flattened on one side, large, shining black, laid singly.

Eggs obtained about July 15, 1917, though repeatedly wet, failed to hatch and appear destined to hibernate.

Grabhamia vittata was described by Theobald from Pecos Canyon, New Mexico, the description being indeterminate and applying to any species of the *cantans* group. Mr. Theobald had males and larvæ, but the genitalia were not described and the larvæ were wrongly associated, being those of *Culiseta incidens* Thomson. The species therefore rests solely on the locality. This is in the Rocky Mountain range and therefore we probably have to do with the species of that region. There are but two of the *cantans* group known from the region and probably but two occur, judging from the analogy of California, where we have two, *increpitus* Dyar in the river pools and *palustris* Dyar in the marshes. I have identified the river pool species as *sansoni* Dyar & Knab; but the name *vittata* remains indeterminate.

The foregoing was written under the assumption that the two Rocky Mountain forms of the *cantans* group were indistinguishable in the female adult. While the manuscript was in the printer's hands, I have gone over the matter more carefully. In California, *palustris* is distinguishable from *increpitus* by the excess of white scales on the wings. It occurred to me that the same might be true of *mimesis* as compared with *sansoni*. A careful examination of females showed that two series could be separated on this character. The distinction is not as marked as in the Californian forms, but it is there. On this basis, I re-examined the three females of *vittata* Theobald which are before me from the lot that furnished Theobald's types, and they are all *sansoni*.

But whether a restriction of *vittata* be made or not, the name becomes a homonym and must be dropped. Bigot described *Culex vittatus* in 1861, which is considered a synonym of *Aedes sugens* Wiedemann. Therefore the name *vittatus* or *vittata* cannot be used again in the genus.

Aedes mimesis, new species.

I propose the name *mimesis* for the unnamed form, since both *sansoni* and *vittata* apply to the river-pool species, the type being the male from Drummond, Montana, mentioned below. The type number is 21553, U. S. Nat. Mus.

The larva of *mimesis* will be the larva from Kaslo, British Columbia, which so closely resembles that of *abfitchii*. As to the genitalia, I have a specimen from Drummond, Montana, which differs distinctly from *sansoni* and comes very close to *palustris* of California. This is entirely as it should be, *sansoni* of the Rockies representing *increpitus* of the Sierras, while *mimesis* of the Rockies represents *palustris* of the Sierras. The genitalia runs as follows:

Basal lobe of sidepiece conical, setose, with a stout seta on the inner angle, but without a strong spine. Filament of harpago small, sickle-shaped.

Spines of basal appendages long.....*palustris* Dyar

Spines of basal appendages moderate.....*mimesis* Dyar

The habitat of *mimesis* appears to be more restricted than that of *sansoni*. I encountered the species only at Drummond, Whitehall, and Bozeman; a small series from Aweme, Manitoba (June 13-July 10, 1910, N. Criddle), are all *mimesis*; no *sansoni* being present.

Psorophora signipennis Coquillett.

Three specimens, Laurel, Montana, July 15, 1917, biting after sunset on the prairie. Previous records of this species are from Mexico, Texas, and New Mexico. The present record extends the known range considerably.

Aedes vexans Meigen (*sylvestris* Theobald).

Males were observed swarming after sunset at Big Timber in the river bottom, in little open glades under willows and on the dark side of bushes. The species is abundant, flying both on the prairie and river bottom, though much more abundant in the latter location. Larvæ were found breeding in temporary irrigation pools.

Hatching experiments were not conducted with this species, but the inference is that part of the eggs will hatch

whenever wet, whether of the same season's deposition or of the previous season's. This is the case with *curriei*, *nigromaculis*, and *trivittatus*, the three other species inhabiting the irrigation pools with *vexans*.

***Aedes trivittatus* Coquillett.**

Found only at Laurel and probably confined to the eastern half of Montana. The adults frequent the river bottom by preference, though they must at least make excursions into the prairie, as larvæ occurred in temporary irrigation pools a mile and a half from the river. The species is rare and cannot be considered as especially troublesome.

The egg is thickly fusiform, pointed at the ends, a little flattened on one side, rather large, shining black, laid singly.

Eggs deposited July 25, 1917, were submerged a few days later and larvæ immediately hatched, but leaving many unhatched eggs in the water. The habit is the same as in *curriei*, that part of the eggs hatch whenever submerged and that the cold of overwintering is not a necessary prerequisite to hatching.

***Aedes cinereus* Meigen. (*fuscus* Osten Sacken).**

This species is confined to the river bottoms and vicinity in the arid country. The little mosquito is a bad biter in the timber and low willows. Males were seen swarming after sunset at Laurel in the river bottom between arched willows about seven feet from the ground. Also males were netted in willows at Lake Cushman, Washington. In the latter case the swarming could not be witnessed, but was undoubtedly taking place. No specimens were seen on the prairie, nor were larvæ bred from temporary irrigation pools in the open. At Missoula an artificial pool under willows was inhabited by the larvæ. In New Hampshire I bred the species from roadside pools following rain, together with *vexans* and *canadensis*. These three species will, therefore, breed in accidental pools all summer, but only *vexans* takes advantage of irrigation pools in the open, the other two species being confined to forested country.

Aedes triseriatus Say.

A single female was taken at Missoula. This is the eastern tree-hole species and was hardly to have been expected in the Rocky Mountain region. At Kaslo, British Columbia, on Kootenai Lake, *A. varipalpus* was the tree-hole inhabiting form. This is not listed by Parker.

Aedes pullatus Coquillett.

This name is used in a general sense to cover the black-legged species of high altitudes. The true *pullatus* doubtless occurs, as we have it from Juliaetta, Idaho, but other similar species have been confused. Solitary rubbed specimens referable to the group were taken here and there, but without males or larvæ certain determination cannot be made. These species fly in May, and, at the time of my visit, had mainly disappeared.

Aedes prodotes, new species.

Mesonotum gray at the sides, a dark brown shade over the disk; in this two narrow lines of small dark brown scales; short lateral stripes posteriorly; area of antescutellar space light gray. Abdomen black with basal segmental white bands; venter whitish scaled with medioventral black stripe, crossed by apical segmental black bands. Legs black; femora white below nearly to tip; knee-spot white; tibiæ with a few gray scales. Wing scales black. Palpi, antennæ, and proboscis black.

Genitalia (see Plate II).—Sidepiece with a well-developed apical lobe; basal lobe conical, setose, with an accompanying single spine; harpago long, slender, curved, uniform; filament long, angularly expanded on one side at base, then tapering to a curved point.

Type, male, No. 21546, U. S. Nat. Mus.; Bozeman, Montana, May 7, 1907 (R. A. Cooley); another male is the same, Banff, Alberta, 1908 (N. B. Sanson), but the vestiture of the mesonotum is indistinct.

The female adult is apparently indistinguishable from *pullatus* or *tahoënsis*. The male genitalia are similar to *lazarënsis*, but differ slightly in the shape of the filament of the

harpago. The coloration of the mesonotum makes an association with *lazarensis* impossible.

***Aedes aestivalis* Dyar.**

Two rubbed females from Evaro (1) are tentatively referred here. The species is abundant in northern Idaho and has been discussed on a previous page. Several specimens from Drummond, listed under *aldrichi*, come very close to *aestivalis*, and, taken alone, would easily be so determined. I think, considering the circumstances, that they are aberrations of *aldrichi*.

***Aedes spencerii* Theobald.**

Only three specimens were captured among numerous *idahoënsis*. *A. spencerii* is dominant on the prairies of Saskatchewan, as shown by Knab, and is represented in southern Montana by *idahoënsis*. Quite possibly the species intergrade on middle ground. The occurrence of so few *spencerii* in this region suggests that it may be here an aberrational form of *idahoënsis*, becoming dominant in the north.

A. spencerii, as found in Saskatchewan, is a medium-sized species, the wing-veins bicolored, the abdomen with a dorsal whitish stripe, often much suffused with white, occasionally the dorsal stripe more or less completely absent; mesonotum gray or yellowish gray, anterior angles brown, dorsal brown stripes usually completely conjoined into a band and touching the short posterior stripes; occasionally the dorsum is suffused with a brown shade. Legs with white scales, often numerous, the tibiæ largely white-scaled above.

The three specimens referable here, from Drummond (July 10), are all of the gray form, old and worn. Two fresh specimens of the yellow form were bred from pupæ in irrigation pools at Laurel, July 17–18. No adults were seen flying at this place. The larva was not obtained, nor has a larva corresponding to that of *spencerii* been taken in Montana. Mr. Parker sent two larvæ on slides, Laurel, August 25, 1914 (R. W. Wells), and Harlem, May 28, 1915 (R. A. Cooley), which do not coincide with any known species (see Plate II).

Head hairs single; air-tube with 17 teeth, the last two or three detached, the tuft arising beyond; lateral comb of eighth segment of 21 scales, each with a large central spine; anal segment not ringed by the plate, which runs close to the ventral line.

If the larva of *spencerii* were unknown, I should be inclined to assign this larva to it. As it is, further investigations must be made. I do not think the larva can be *idahoënsis*, which should be closer to *spencerii* than this is. There is thus a fifth species, whether *spencerii* or not cannot yet be said with certainty, breeding in irrigation water after the disappearance of the early spring brood, but in negligible numbers.

***Aëdes idahoënsis* Theobald.**

Very common on the limited prairie surrounded by mountains, especially in western Montana. At Laurel females were scarce, though males were still swarming, and the species seemed to be disappearing. It was rare at Sandpoint, Idaho, in forested country. All the specimens taken in western Montana have the abdomen with basal bands only. At Drummond a few *spencerii*-like forms were taken, as noted above. Farther east the typical form obtained again.

At Bozeman the males were observed swarming. I went out toward the prairie at sunset, and, as the sun set, males were seen in a swarm over my head. The group would augment in number, then diminish, keeping about a foot overhead, all the individuals facing toward a light breeze which blew from the south. Two boys, perched on top of a water tank, called out that there were mosquitoes up there, but they were not bitten. The tank was at least 25 feet from the ground. At the same time females were attempting to bite in the grass about ankles and knees. At Laurel the males were repeatedly seen swarming over low isolated bushes (*Sarcobatus vermiculatus*) in company with *nigromaculis* and *curriei*, but always in separate swarms, each with its own relation to the bush.

The species exhibits a certain variability. The intergradation toward *spencerii* in the Missouri valley has been noted. The species also intergrades toward *aldrichi* at the timber in the river valleys, which it invades to some extent.

Eggs obtained from captive females are long, slenderly spindle-shaped, shining black, laid singly.

***Aedes aldrichi* Dyar & Knab.**

This is the smallest *Aedes* known to me. While varying in size, as all mosquitoes do, the average is small and often minute. When biting, and the proboscis is driven far down, the little insect tips up behind and sometimes loses hold with all its legs, suspended by the proboscis. The species inhabits the river bottoms strictly, never straying far from the edge of the timber. It is a close ally of *idahoënsis*, but smaller, the wing-scales all dark. The mesonotum has the two dorsal brown lines narrow and separated, the anterior angles gray. Certain intergrades occur, as noted above, but not in the typical dense forested areas.

A mount was prepared from a male taken in the timber with numerous females of typical *aldrichi*, at Big Timber, July 13, 1917. The genitalia (see Plate II) have the apical lobe of the sidepiece well rounded off and bulbous, continued narrowly basally, but not reaching basal lobe, clothed with small, sparse, nearly straight setæ; basal lobe expanded, tubercular, a moderately stout spine arising from the inner (ventral) margin, without long setæ, the setæ on the inner margin of the lobe becoming dense, but not much longer than elsewhere; filament of harpago angularly expanded near the middle.

The genitalia are, therefore, much as in *idahoënsis* and *spencerii*, differing in the reduction of long setæ which accompany the spine of the basal lobe in those species.

NOTES ON *Aedes curriei* (COQUILLET)

(Diptera, Culicidæ)

BY HARRISON G. DYAR AND FREDERICK KNAB

This peculiar mosquito was first made known in North America from the plains of North Dakota, under the name *Culex curriei* Coquillett. In coloration it essentially resembles *Aedes dorsalis* (Meigen) of Europe, and it is doubtful if Coquillett would ever have separated it therefrom except that, through an error, he was led to believe that the claws of the female were simple in one case and toothed in the other. The error was subsequently corrected, but the species was left to stand on account of what had been discovered in the meantime. This was that mosquitoes of the same general habitus bred in the tidal pools on the coast of California and others were found in central New York State in the general vicinity of the salt wells, while it was to be assumed that those from the western plains bred in temporary pools of fresh water. Here was an obvious difference in habit, indicating apparently three species, one on the great western plains, one on the California coast, and a third in the Atlantic region. These forms received names as species, the Californian one being called *quaylei* by Dyar & Knab from the larvæ and *lativittatus* by Coquillett on the adults. Those from New York were named *onondagensis* by Dr. E. P. Felt. To add to the apparent difference of these forms, Knab discovered the larvæ of the inland *curriei* in Saskatchewan and found marked differences in the number of head hairs and in the distinctness of the central spine of the lateral comb scales. The larvæ of the Pacific and Atlantic forms proved to be much alike. In the monograph¹ we rely mainly on the larva in our separation of the forms, classing *quaylei* as a race of *onondagensis* and holding them distinct from *curriei* on this and on habits, *curriei* appearing to have but a single spring generation in the water following the melting snow, while *quaylei* bred monthly in the high tide pools along the coast. Of the habits of *onondagensis* we knew

¹Howard, Dyar & Knab, The Mosquitoes of North and Central America and the West Indies, iv, 629-638, 1917.

nothing, but imagined vaguely that they must in some way resemble those of *quaylei*. Of course, with two species and a race in America, the European *dorsalis* did not concern us much, as it was quite presumably distinct.

While the monograph was still in press, in 1916, the senior author obtained eggs from captive females in Nevada, a typically inland place and therefore certainly *curriei*. He wet the eggs after first drying them, and, contrary to expectation, the larvæ immediately hatched. To add to this heretical behavior, for, being *curriei* with supposedly but a single annual generation, they should not have hatched until after being subjected to the cold of a northern winter, the head hairs were single and the comb scales without a distinct central spine, thus agreeing with *quaylei* or *onondagensis*. It still appeared possible that there were two species mixed up under *curriei* and that one of them was perhaps to be considered *medio-lineata* Ludlow, which was referred in the monograph as a melanotic form of *curriei*. However, no change was introduced in the monograph, which was published immediately. The following year the senior author continued his investigations, this time in Montana, where he found that the *curriei* larvæ were of the same form as in Nevada, and, moreover, had the habit of breeding in irrigation pools at intervals all through the summer. The supposed difference in habit between the coast form and the inland form no longer existed, since eggs of either hatched whenever they were wet, whether the water were salt tidal water, or spring rains, or melting snow, or accidental irrigation pools. Moreover, the larval differences had likewise disappeared, and the question had come around to the correctness of the junior author's observations in Saskatchewan. The material was, therefore, carefully gone over and it was found that, while there were plenty of true *curriei*, the particular skins which had been mounted and studied as *curriei* for all these years were nothing but *canadensis*. The true *curriei* from Saskatchewan have single head-hairs and the scales of the lateral comb without strong central spine exactly as in Nevada and Montana. This unfortunate mistake created a complicated viewpoint and has led to a

great deal of trouble; but we are now able to solve the mystery and correct the synonymy of this species.

In the monograph (pp. 618, 631, 634, and 637) we give differences in the male genitalia, stating that in *curriei* and *onondagensis* the stem of the harpago is slender, but stout in *quaylei*. It does so appear in the old slides of *quaylei*, one from Oakland, California, June 24, 1903 (I. McCracken), another from Tacoma, Washington, August, 1906 (Dyar & Caudell); but these have been strongly pressed. In a fresh preparation from Atherton, San Mateo County, California (L. McRoberts), which has not been pressed, the difference is not appreciable. The two pressed slides were prepared by Mr. H. S. Barber, while all the rest, except one *onondagensis*, which was prepared by Mr. O. A. Johannsen, were made by the junior author. The supposed specific character of *quaylei* is therefore due to the method of preparation.

There is some variation in the comb-scales of the larva, which might mislead the inexperienced. The free margin of the scale is drawn out into a series of teeth, those at the tip longest. Usually there are a number of subequal teeth at the tip; however, sometimes there is a distinctly longer one in the middle, but without structural difference. In the type that we define as having a "differentiated median tooth," the tip of the scale is drawn out to a long spine, while on each side there is a marginal row of cilia. In all the larvæ of *curriei* we have examined, rows of minute spicules are present on the skin. They vary considerably in abundance and can only be detected under high magnification.

Aedes curriei thus constitutes but a single species ranging over most of the United States. The other names cited are based upon illusory differences and will become synonyms. The stronghold of the species is in the western plains and the desert country of Utah, Nevada, and eastern California; but it penetrates to all the coasts, having been taken on the coast of New England and on the Gulf of Mexico. It has been taken near Chicago, and is probably scattered through open country here and there, finding a local abundance in favorably situated tidal pools. It does not occur in forested country, which

explains its rareness in the East. Salt marsh pools, it may be noted, are not forested and hence the occasional occurrence of the species on the Atlantic seaboard. The species has as many generations in the year as the conditions warrant, although probably only part of the eggs hatch at each successive wetting. Dyar demonstrated this in Nevada, where he obtained as many as three sets of larvæ from one deposition of eggs.

In regard to the European *dorsalis*, since there is but one species in America, there is probably but one in Europe, and *dorsalis* and *curriei* may properly be compared. As regards coloration, no differences appear. Unfortunately, we do not know the larva of *dorsalis*¹. The male genitalia are very similar to those of *curriei*; but we have only a single mount of *dorsalis*. In that, the two spines of the basal lobe of the side-piece seem more approximate than in *curriei*. We do not detect any other difference; but on account of the paucity of our information about *dorsalis*, we must leave the question of the exact relation existing between the American and European forms for the present undecided.

A NEW ORTALID FROM THE PHILIPPINES

(*Diptera, Ortalidæ*)

BY FREDERICK KNAB

The following new species was reared in the course of investigations by the Philippine Bureau of Agriculture and transmitted by the Entomologist, Mr. D. B. Mackie, to the Bureau of Entomology in Washington for determination. It is described herewith, so that the name may become available.

Plagiostenopterina hendeli, new species

Female.—Frons dull piceous black, deeply impressed at sides

¹F. W. Edwards (Bull. Ent. Res., vii, 217, 1917) mentions the larva of *dorsalis* thus: "Antennae conspicuously pale at the base; about 24 scales in the comb of the eighth segment; scales pointed * * * and heavily fringed (of the even type); teeth of pecten with two or three serrations near the base, of which the apical one is considerably the largest; gills scarcely half as long as the anal segment, bluntly pointed." Unfortunately, the head hairs are not mentioned.

of ocellar triangle, transversely thickened in front; median portion very finely and closely strigose, with long and very fine, rather sparse hairs. Ocular margins white. Face and clypeus broadly black in the middle, dull ferruginous red at the sides, the antennal grooves silvery pruinose, the intervening ridge less strongly so. Antennæ ferruginous red, the third joint pruinose and somewhat darkened at tip and on outer side to near base; arista slightly ciliate basally, the first two joints ferruginous, the part beyond black. Palpi black. Mesonotum metallic green, without pruinosity and with complete median stripe and postsutural lateral stripes darker metallic blue, the surface roughened and clothed with short pale hairs; transverse suture obsolete on the disk; humeral callosities bright blue, shining, clothed with long white hairs; macrochætæ black. Scutellum concolorous with mesonotum. Pleuræ metallic green-blue, the meso- and sternopleuræ white-pilose. Abdomen shining dark metallic green and violet-blue, the third and fourth segments with broad basal bands of white hair, the fifth segment nearly wholly white-haired; second segment with long outstanding white hairs at the sides. Front coxæ and femora bright ferruginous yellow, the latter slightly darkened apically, the tibiæ and tarsi wholly black. Middle and hind legs with the coxæ black, the femora ferruginous yellow on basal half, blackish beyond; tibiæ piceous, indistinctly reddish on basal half; tarsi with the first two joints dull ferruginous yellow, the distal ones black. Wings hyaline inclusive of costal cell; stigma and a large subquadrate apical spot involving apices of third and fourth veins blackish; no traces of pigmentation elsewhere; last section of the fourth vein strongly bent forward beyond its middle; scale white. Halteres white, the base of stem blackish. Length: Body about 7 mm., wing 5 mm.

Male.—Very similar to the female in coloration. Arista without palette.

Philippine Islands (Acc. no. 2391, Bur. Agric., P. I.), 4 females, one male.

Type, Cat. no. 21552, U. S. Nat. Mus.

It gives me pleasure to dedicate this interesting species to

Prof. Friedrich Hendel, of Vienna, who has done so much to advance our knowledge of the Acalyptrate Muscoidea.

The extent of the apical wing-spot is somewhat variable. Usually it is limited by the fourth vein, but in one specimen extends well over into the second posterior cell; in another specimen it stops short of the middle of the first posterior cell. There is also some variation in the mesonotal coloration, the stripes being obsolete or nearly so in some specimens.

A NEW AEDES FROM THE ROCKY MOUNTAIN REGION

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

Aedes acrophilus, new species.

Head with creamy yellow scales; a black spot on each side of the vertex and a lateral one below. Mesonotum with golden brown scales, creamy on the lateral margins and antescutellar space; two narrow lines of dark brown, small scales and still narrower posterior subdorsal lines; a narrow central dorsal dark line, formed by the parting of the scales. Abdomen black, with basal segmental white bands, widening at the sides; venter whitish with traces of medioventral black spots near the apices of the segments. Wing scales black. Legs black; femora white beneath nearly to tip; knee spot white; tibiæ largely gray-scaled.

Larva.—Head hairs, upper in 5, lower in 4; lateral comb of the eighth segment of about 20 scales, evenly fringed, without strong central spine; anal segment with large plate, not ringed; air tube moderate, the pecten evenly spaced, the tuft arising beyond it.

Type, female, No. 21548, U. S. Nat. Mus.; Lake Louise, Laggan, Alberta, Canada, August 18, 1906 (Dyar and Caudell).

Of the described *Aedes* with black legs from North America, the larvæ of the following are unknown: *diantaeus* Howard, Dyar & Knab, *thibaulti* Dyar & Knab, *aldrichi* Dyar & Knab,

idahoënsis Theobald, *prodotes* Dyar, *plutocraticus* Dyar & Knab, *balteatus* Dyar & Knab, *decticus* Howard, Dyar & Knab, *cataphylla* Dyar, *nubilus* Theobald, *fisheri* Dyar, *ventrovittis* Dyar, *centrotus* Howard, Dyar & Knab, *provocans* Walker, *augustivittatus* Dyar & Knab, *obturbator* Dyar & Knab, *condolescens* Dyar & Knab, and *leucomelas* Lutz.

Of these, only *diantaeus*, *decticus*, *prodotes*, and *centrotus* can be compared with *acrophilus*. *A. prodotes* inhabits the same general region, the Rocky Mountains, but has a gray mesonotum, like *pullatus*, whereas *acrophilus* is golden yellow. The coloration of the adult of *diantaeus* is unknown, the species being founded on the male genitalia; but it comes from the mountains of New Hampshire and is probably a different species. *A. centrotus* and *A. decticus* are from the region north of Lake Superior. The former has the mesonotum all brown dorsally as in *auroides* Felt and *provocans* Walker, and, therefore, does not agree. *A. decticus* comes closest, having the same black-spotted head; but besides the different faunal region, *decticus* has the abdominal bands obsolete dorsally, the tibiæ are entirely black without gray scales, and the mesonotal brown stripes are much broader than in *acrophilus*. It therefore appears that this represents a distinct species.

DESCRIPTIONS OF SOME LEPIDOPTEROUS LARVÆ FROM MEXICO

By HARRISON G. DYAR

NYMPHALIDÆ

Peridromia amphinome Linn.

Head shining black, angled, roughened with points below, on the sides forming several short horns; each lobe produced into a long spine, three times the height of the head, with three or four short branches, ending in a slight knob tipped by yellowish, the whole spine minutely spinulose. Body cylindrical, the prothorax rather small, mesothorax slightly inflated. Black,

paler in the incisures, with several oval white spots laterally on the thorax, resembling Tachinid eggs. Posterior end also black; joints 6–10, however, lighter and ornamented with a design in cream-color. This consists of a broken dorsal line, forming an ellipse between the subdorsal spines and a bar at the posterior edge of the segment; two subdorsal lines joined at the ends into a broken figure of 8; a few lateral pale oval specks; a large red blotch about the subventral spines and another over the spines above the bases of the feet. Dorsal spines on segments 12 and 13 only; subdorsal and lateral spines long, branched, spinulose basally, black on joints 2–5 and 11–13, cream-color with black tips on joints 6–10. Subventral spines, one branched and one single; two single spines above bases of feet. Feet pale.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

SATURNIIDÆ

Hylesia umbratula Dyar.

Head rounded, higher than wide, shining dark coral red with brownish secondary hairs. Body black, feet, cervical shield, and anal plate red. Spines long, slender, uniform, with rather long branches, cream-color. Markings in cream-color, consisting of an irregular quadrate ring about the subdorsal spines and a small one around the lateral spine, followed by a band, which runs to a lateral line that forms an arc across the intersegment from spiracle to spiracle; a straight substigmatal line, irregular on its upper edge.

Teapa, Tabasco, Mexico (W. Gugelmann).

Hylesia euphemia Dyar.

Head rounded, higher than wide, shining black on the face, the cheeks luteous; a white line in vertical suture and a V-mark over clypeus. Body sordid brown, with many pale dots at the fine white secondary hairs; a double dorsal reddish line on the anterior halves of the segments; a single subdorsal line, more continuous; a single suprastigmatal line, also reddish; lateral space blackish shaded; a whitish substigmatal line, the subventral space again blackish. Subdorsal spines on joints

6–11 shortened, bushy, the rest uniform with somewhat tufted tips; shaft and tips black, the lateral branches pale.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

SYNTOMIDÆ

***Pseudosphex strigosa* Druce.**

Head small, rounded, black, wider than high, a pale line in the vertical suture. Body dark without prominent markings; some pale lines in the intersegments, especially joints 2–3. Hairs moderate, black, in tufts from the warts, barbed. On joints 4 and 11, from tubercle iii and below it, a pair of black sac-shaped appendages, nearly as long as the hairs.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

ARCTIIDÆ

***Halesidota annulosa* Walker.**

Head rounded, wide, shining black; median suture and V-mark over the clypeus whitish. Body pale yellowish, without marks; warts i and ii dusky, the rest unicolorous with the skin. Hairs in dense even spreading clusters, soiled white. Two slender black pencils on joint 4 on each side; a single pencil from wart iii on joint 12 and a few black hairs subdorsally on joint 13, which also bears a dorsal angular black mark.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

LASIOCAMPIDÆ

***Claphe submarginalis* Walker.**

Head rounded, bilobed, squarish, flattened before, with fine white secondary hairs; dark brown, the upper half of clypeus pale; a white line across the eyes, a mark over mouth and a mark on the vertex of each lobe, consisting of two lines meeting a cross-line in front. Body flattened, arched, with subventral rounded lappets. Cream-color, with chocolate brown markings, forming many bands of irregular confluent dots; in the incisures, a single transverse row of coarse black dots; in the incisures 5–6 and 6–7, a black area, centrally waxy black. this part capable of being concealed when the segments are

retracted; a black patch centrally dorsally on joint 8. Wart i shows black, small; secondary hairs short, few, tufted on the anterior edges of the segments, especially on joints 6 and 7, where they form collars, dense subventrally; lappet-hairs long, pale, mixed with blackish at base. Feet red.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

NOTODONTIDÆ

Naprepa houla Dyar.

Head rounded, bilobed, smooth, green; antennæ black. Body with a low, annular oblique enlargement on joints 5 and 10. Green, with coarse, striking markings: A blood-red band, edged behind with white, on joints 5 and 10, starting before the spiracle and running in an arc to the posterior edge of the segment dorsally; a similar stripe on joint 13, black and edged with white in front; a series of round orange spots in blood-red rings as follows: On joint 2, at spiracle and base of foot; on joints 3 and 4, three lateral spots and one on the base of the foot; on joint 5, one below the spiracle; on joints 6–12, a group of three at spiracle—one on it, one below, one posterior—and one on base of foot or tubercle vii; on joints 7–9, in addition, a row of six spots across the dorsum on the anterior part of the segment. Anal plate brown, stained with red in front.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

PYRALIDÆ

Myelobia smerintha Hübner.

Head small, rounded, luteous, the mouth broadly blackish. Body thick in the middle and tapering to small ends, luteous or whitish, with faint broad purple lateral shades, less distinct in the mature larva. Tubercles small, setæ inconspicuous, iv and v superposed subventrally, apart, but united by a band of drawn-out chitin.

Internal feeders in stems of bamboo.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

HEPIALIDÆ

Phassus triangularis Edwards

Head rounded, spherical, the mouth opening circular; wrinkled-corrugated, black. Body dark red-brown, coarsely annulate, with pale luteous, contrasting, elevated areas: Cervical shield very large, red-brown, the lateral area of joint 2 elevated about the spiracle; joints 3 and 4 with two transverse areas, the anterior one lunate, reaching the lateral area, the posterior one running down to the subventral folds, which are touched with the elevated color; on joints 5-12, anterior area an elliptical dorsal saddle, posterior area a narrow line, broken into little spots; three lateral spots—one above the spiracle, one before, and one behind—and one long subventral area of the pale color. Crochets of the feet in a complete ellipse, pointed on the inner side, the crochets of equal length. Feet surrounded by a ring of pale color.

Misantla, Vera Cruz, Mexico (W. Gugelmann).

A NEW PYRALID FROM CALIFORNIA

(*Lepidoptera, Pyralidæ*)

By HARRISON G. DYAR

Noctuelia minima, new species.

Head and thorax above dark brown-gray; a white line above the eye; palpi with white scales intermixed. Abdomen gray, with white scales toward the apices of the segments, becoming scattered and predominant posteriorly. Fore wing with the basal and terminal spaces dark olive gray, uniform; median space broadly white with a central olive shading, which is broken through the middle; the white area is bordered by black lines, the inner line bulging in the middle and excised on vein 1, the outer line broadly waved, incurved on submedian space. There is a tint of brown to the olive-gray areas that disappears under a lens. Hind wing white, without dark border or any dark shade whatsoever. Expanse, 8 mm.

Type, male, No. 21549, U. S. Nat. Mus.; Pasadena, California, April 30, 1909 (F. Grinnell, Jr.).

NEW AUSTRALIAN CHALCID-FLIES

(Hymenoptera, Chalcididæ)

By A. A. GIRAULT

(Continued from page 96)

Copidosoma australia, new species.

Female.—Length, 1.60 mm., excluding the ovipositor which is somewhat shorter than the abdomen. Very similar to the description of *compressiventris* Girault but differing as follows: General color black green, the tarsi of the cephalic legs dusky, the pedicel is twice longer than wide at apex, slightly longer than funicle 2 which is plainly twice longer than wide and a little the longest; club 1 subequal to funicle 6. Proximal tarsal joints long. Axillæ very widely separated. Scutellum longitudinally, finely striate, subglabrous at distal third. Propodeum short, with a median carina. Hind tibiæ with two spurs, one very short. Frons broad.

One female, October 24, 1914. From grass in a civic park. Common.

Habitat: Muswellbrook, New South Wales.

Types: In the Queensland Museum, the specimen on a tag with types of *australis*.

Copidosoma australis, new species.

Female.—Differs from *australia* in having the frons moderately narrow, about thrice the diameter of the cephalic ocellus, and the axillæ are joined. In the foregoing species the frons is over six times the diameter of the cephalic ocellus. Also, here, the thorax is distinctly more narrow, the scutellum a little less distinctly striate. A very narrow species.

Two females, October 26, 1914. From grass in a civic park. Common.

Habitat: Muswellbrook, New South Wales.

Types: In the Queensland Museum, the females with type *australia*.

Copidosoma australica, new species.

Female.—Like *australis* but the axillæ are large and narrow,

separated a little, and the scutellum is uniformly densely scaly punctuate. The body is more æneous.

One female with the preceding species. Common.

Habitat: Muswellbrook, New South Wales.

Type: In the Queensland Museum, a female on a tag with a paratype female of *australis*.

Male club solid. The hypopygium covers the ovipositor to tip of abdomen. Head as in *Spalangia* as to shape, the scrobes forming a long triangle.

***Aphycus sanguinithorax* Girault.**

The scape is not much dilated.

***Aphycus coccidiphagus*, new species.**

Female.—Length, 1.10 mm., excluding the ovipositor which is extruded for a length a little over half that of the abdomen. Golden yellow, the wings hyaline, the venation yellow; pronotum broadly mesad and cephalic margin of the axillæ, embrowned. Pedicel stout, slightly longer than wide, longer than any of the funicle joints of which 1–2 are subquadrate, 3–4 each a little wider than long, 5 and 6 still wider, 6 largest. Marginal vein punctiform, as long as the postmarginal, the latter somewhat more than a third the length of the stigmal. Mandibular teeth acute, 3 shortest. Hairless line of fore wing closed caudad, with numerous lines of cilia proximad of it. Club wider than the funicle and three-fourths its length. Cheeks longer than the eyes, the face strangely inflexed, the frons of moderate width. Fore wings densely, finely ciliate. Venation dusky yellow. Caudal wings with about eighteen lines of very fine discal cilia where broadest. Axillæ a little separated. Scape a little compressed.

Six females from a *Rhizococcus* (?) on *Leptospermum*, December 22, 1899 (A. Koebele).

Habitat: Botany Bay, Sydney, New South Wales.

Types: Cat. No. 20673, U. S. Nat. Mus., the specimens on a slide.

***Homalotylus microgaster*, new species.**

Female.—Length, 1.60 mm. Dark metallic blue, the legs

concolorous except the large middle tibial spur and the middle tarsi which together with funicle 6 and the club are white. Fore wings with a broad black stripe across them from the bend of the submarginal vein to apex of the postmarginal and at immediate base fuscous. Tegulæ white, black at tip. Venation blackish. Pedicel two-thirds longer than wide at apex or more, the funicle joints short, 1 slightly longer than wide, the others slightly shortening in succession. Club about half the length of the funicle, the latter somewhat shorter than the scape. Head very finely, densely punctulate, with scattered, much larger setigerous pin-punctures. Scutum similarly densely scaly and with dense setigerous pin-punctures. Scutellum and axillæ sculptured like the head. Abdomen scaly. Hairless line of fore wing with many lines of cilia proximal of it.

Agrees with the description of *Copidosomyia* but is different in that the marginal vein is punctiform, the postmarginal elongate, slightly shorter than the stigmal. Hind tibiæ a little flattened, the spur single. Second two teeth of mandible as if formed by a slight concavity of a truncate tooth (thus three obtuse teeth). Club obliquely truncate from base. Lateral ocelli barely separated from the eyes but nearly twice their diameter from each other. Scape long. Axillæ with a very short carina between them. Abdomen smaller than the thorax. Tegulæ large. One very short ring-joint. Antennæ inserted at the ventral border of the mouth, the scrobes absent.

Four females in the U. S. National Museum. (A. Koebele.)

Habitat: Australia (Eastern).

Type: Cat. No. 20674, U. S. Nat. Mus., two females on tags and a slide with two pairs of antennæ, a fore wing, head and hind tibiæ. *Cotype*: In the Queensland Museum, a female on a tag.

Differs from *H. obscurus californicus* Girault mainly in having the pedicel longer and the club apparently unjointed. Types compared.

ANAGYROPSIS, new genus

Genotype: *Anagyrus purpureus* Girault.

This name should be substituted for *Anagyrus* at the following places in the Memoirs Queensland Museum, IV, pt. VII: page 80, line 21; page 117, line 8; page 138, line 28; page 147, line 10 from bottom; page 155, line 16 from bottom; page 160, line 8; page 174, line 9.

Heterarthrellus australiensis Howard.

Genotype the same as *Epidinocarsis* Girault. *Dinocarsis* Foerster is no doubt the same and takes precedence.

Dinocarsis abnormis, new species.

Female.—Length, 1.65 mm. Dark metallic purple, the head except antenna, prothorax except cephalic face above and the caudal margin of pronotum and the scutellum except the median line from base to a little beyond the middle, deep orange yellow, also the base of the tegula very narrowly. A lunula laterad in front of the tegula, middle tibiæ except ventrad and rather broadly at tip and the middle tarsi, silvery white; other tarsi brownish. Antennæ wholly purple. Fore wing deeply embrowned from a little distad of the middle of the submarginal vein to apex but with a conspicuous, tolerably narrow, slightly convex, naked cross-stripe from the apex of venation (its proximal edge tipping apex of the stigmal vein). Oblique hairless line closed caudad (some distance distad of the proximal end of the infuscation). Venation black. Post-marginal vein three-fourths the length of the stigmal which is somewhat shorter than the marginal. Funicle 1 nearly twice longer than wide, distinctly shorter than the elongate pedicel, 6 somewhat wider than long. Hind tibial spurs double, very unequal. Cheeks much shorter than the eyes. Face sublenticular, the scrobes distinct, short, not joined dorsad. Frons moderate. Sides of propodeum with a short, silvery pubescence. Sculpture very fine, delicate scaliness. A short carina between the axillæ.

Differs from the genotype in having the foliaceous expansion linear or rectangular, subparallel with the shaft of the scape, not greatly convexed.

From one female, eucalyptus forest, November 1, 1914, Brooklyn, New South Wales (Hawkesbury River).

Type: In the Queensland Museum, the female on a tag, a fore wing and a hind tibia on a slide.

Dinocarsis flavimesopleurum, new species.

Female.—Length, 1.35 mm. Black, the wings hyaline, the venation pale yellowish; head except cheeks and the face below the middle (about ventral half), and the mesopleurum, orange yellow; pronotum and tegulæ (except outer edge broadly along distal three-fourths), honey yellow. Thorax downy. Face inflexed. Axillæ with a slight carina between them. Legs (except coxæ) and the funicle, dull yellow; rest of antennæ black, the much dilated scape with a white stripe across it near tip and white at the base of its body; pedicel white at tip, slightly shorter than funicle 1 which is two and one-fourth times longer than wide. Marginal and stigmal veins subequal, the postmarginal subobsolete. Hairless line closed caudad, with numerous lines of cilia proximad of it, running all the way to base. Hind tibial spurs double. Scape coarsely scaly. There may be a white lunula before the tegula on lateral thorax.

From three females in U. S. National Museum, labeled "837. Perth, W. Australia, G. Compere, Collector."

Type: Cat. No. 20675, U. S. Nat. Mus., a specimen on a tag plus a slide with head, fore wing, antennæ, and a hind tibia. Cotype: In the Queensland Museum, a female on a tag.

XENANUSIA, new genus

In my table of genera runs to *Epanusia* Girault but differs markedly in the venation, the marginal vein linear, the stigmal distinctly as long as it, the postmarginal shorter, about half the length of the stigmal. Second spur of hind tibiæ no longer than and scarcely thicker than the apical fringes. Head longer than wide, lenticular, but the scrobes distinct but not long. The fore wings are marked somewhat like those of *Habrolepis zetterstedtii* Westwood. Ovipositor apparently free.

Xenanusia pulchripennis, new species. Genotype.

Female.—Length 1 mm. Dark metallic purple, the tarsi pallid. Fore wings hyaline but bearing the following conspicuous brown pattern: A midlongitudinal cone, spoke, or path runs from a point one-third the way from apex to apex of venation proximad to the caudal margin which it runs into broadly opposite most of the submarginal vein; in center of this path (which is a little caudad of middle), a very small round hyaline spot; from the cephalic, distal, and caudal edges of it, six rays or spokes to the margin, all of tolerable length, the first at the venation, short, curved, thickened toward apex and embracing the stigmal and postmarginal veins, the second next longest, more uniform in width, midway between 1 and 3; 3 longest and thickest, at the distocephalic apex; 4 at the distocaudal apex; 5 and 6 shortest, the reciprocates of 2 and 1 respectively; the round dot is between the bases of arms 2 and 5. Arms 1–3 are cephalic; 4–6 caudal. Thus, there is a broad hyaline path from arm 1 proximad to base along the venation; of the hyaline areas blocked off by the arms, that between 1 and 2 is largest, those between 4 and 5 and 6 and the base of the central path at caudal margin, smallest but both distinctly larger than the central spot near the end of the path. Body densely scaly. Axillæ slightly separated. Frons broad. Face inflexed. Flagellum gradually narrowing, the funicle joints decreasing in size distad; pedicel very small. Club ovate.

Ten females, "1038—Swan River, West Australia. G. Compere."

Type: Cat. No. 19153, U. S. Nat. Mus., four females on tags and a slide. Five paratype females in the Queensland Museum.

Xenanusia gigantea, new species.

Female.—Length, 2.15 mm. Dark metallic purple, the longer than wide head orange yellow except ventrad of the scrobes. Tips of the tibiæ and the tarsi yellow; distal tarsal joint dusky. Fore wings hyaline, with a broad fuscous band across it from the bend of the submarginal vein to apex of the

stigmal, the proximal margin of this band straight, its distal margin beveled off to the apex of the stigmal vein. Venation fuscous, the marginal vein about eight times longer than wide, the stigmal somewhat longer, long and slender, the post-marginal barely developed. Oblique hairless line closed caudad, not reaching by far the proximal margin of the fuscous cross-stripe which is coterminous with the discal ciliation. Club not much longer than wide, hive-shaped, narrower than the funicle which narrows distad; funicle, largest (longer down one side than the other), much wider than long, 6 over four times wider than long, shortest; pedicel very minute. Scape greatly dilated. Hind tibial spur single. Frons moderate. Cheeks shorter than the eyes. Scrobes not joined above but distinct. Head lenticular, longer than wide. Club one-third the length of the flat funicle. On the fore wing a narrow marginal naked space along the distal margin of the fuscous marking. Scutellum more densely, finely scaly than the scutum. Axillæ separated by a very short carina. Scutum with tolerably dense short pubescence.

From one female on a tag in the U. S. National Museum. labeled "*Dactylopius*. Adelaide, S. A., 16," but mounted with what appears to be a dipterous puparium upon which it is parasitic. From Arthur M. Lea.

Type: Cat. No. 20884, U. S. Nat. Mus., the above specimen and a slide.

NEORHOPUS, new genus

Female.—Differs from *Rhopus* in having the mandibles with three small, acute teeth, the marginal cilia of the fore wing absent and in the venation. Marginal vein somewhat longer than wide, subequal to the postmarginal, the stigmal somewhat longer. Differs from *Psylledontus* Crawford in having the postmarginal vein, in being nonmetallic and having the body longer as in *Rhopus*. Ovipositor inserted somewhat distad of the middle of the abdomen, the latter conical, somewhat longer than the rest of the body. Thorax with a phragma. Axillæ narrowly joined. Caudal femur compressed, rather large. Head round, the face inflexed. Frons broad. Cheeks shorter

than the eyes. Middle tibial spur not very long, rather slender. Caudal tibial spurs single. Costal cell very narrow. Ovipositor free.

Neorhopus australicus, new species. Genotype.

Female.—Length, 0.75 mm. Brown, the wings subhyaline, the venation dusky yellow, the antennæ darker brown, the fore wing embrowned along just under the marginal and stigmal veins. Tarsi and tips of caudal tibiæ rather broadly pallid. Discal ciliation of the fore wing uniformly rather dense but very short. Funicles 1–3 ring-like, subequal, 4 larger, 5 largest, a little wider than long, 4 wider than 3. Pedicel stout, somewhat longer than wide, distinctly longer than funicle 5. Club somewhat longer than the scape.

From one female on a slide labeled: “2013. *Sphærococcus obscuratus* Mask. *Eucalyptus* sp. Parramatta, N. S. W. Sep. 22, 1899. A. Koebele.”

Type: Cat. No. 20885, U. S. Nat. Mus., the above specimen.

Neorhopus australicus aureus, new variety.

Female.—Like the preceding but golden yellow. A female on the same slide.

Type: Cat. No. 20886, U. S. Nat. Mus., the described specimen.

NEABROLEPOIDEUS, new genus

Female.—In my table to the Australian Ectromini runs to *Habrolepoidea* Howard but differs in having the marginal vein linear, five times the length of the short stigmal, the post-marginal distinct but very short. Also, the body is more robust, the ovipositor distinctly extruded for nearly a half the length of the depressed abdomen, the flagellum is not clavate as in the named genus but filiform, the club wider than the funicle; also the frons is narrow (moderate in the other) subprominent, the vertex not flat, the face inflexed. Flagellum short and clavate in the named genus, here the funicle joints all longer than wide. Mandibles with the broadly truncate second tooth with its apical margin concaved. Hind tibial spurs double, unequal. Axillæ with a fine carina between

them and cheeks a little shorter than the eyes. Scrobes forming a triangle. Scutellum rounded at apex. Hypopygium nearly reaching apex. *Habrolepoidea* bears tridentate mandibles.

Neabrolepoideus bioculatus, new species. Genotype.

Female.—Length, 1.60 mm., excluding the ovipositor. Purplish black; cephalic tarsi brown; apex of ovipositor valves whitish; other tarsi, apex of middle and hind tibiæ narrowly, base of middle and caudal tibiæ rather broadly (not any of the knees), silvery white. Distal joint of middle tarsi and distal two of caudal tarsi, purplish. Middle tibial spur white. Fore wings embrowned slightly at base and from the bend of the submarginal vein nearly to apex, the brown broken by two large oval, opposite marginal spots (one at each margin), the cephalic somewhat larger and at apex of the brown venation. Pedicel and funicle joints subequal, each somewhat over a half longer than wide. Head and thorax densely scaly and with not dense but distinct silvery pubescence. Club not quite half the length of the funicle.

From three females in the U. S. National Museum "987. Perth, W. Austr. G. Compere."

Type: Cat. No. 20890, U. S. Nat. Mus., two females on tags and a slide.

Bavanusia margiscutellum, new species.

Female.—Length, 1.10 mm. Dull golden yellow, the fore wings embrowned from the base of the hairless line to apex; legs and antennæ black (first and second knees broadly, tips of middle tibiæ broadly, middle tarsi and proximal four tarsal joints of hind tarsi, white). Scutum and the interior of scutellum (proximal and distal margins but narrowly yellow), propodeum and abdomen dark metallic blue. Club obliquely truncate from base of joint 3, subequal in length to the funicle. Cheeks below the eyes and sides and venter of the thorax blue. Pedicel a little longer than wide. Funicle 6 largest but much wider than long. Body finely scaly. Axillæ with a short carina between them. Middle femur white along prox-

imal two-thirds and at distal fifth. Mesopleurum scaly. Hind tibial spurs not seen. Marginal vein black, over twice the length of the stigmal. Except for the club about as in the genotype. Ovipositor free.

From one female on a slide in U. S. National Museum, labeled "1149. *Mytilaspis* (*Chionaspis*) *casurinae* Mask. Brisbane, Queensland, January 2, 1900. On *Casuarina*. A. Koebele."

Type: Cat. No. 20891, U. S. Nat. Mus., the above specimen.

B. parsimilis Girault is the same as the genotype, a variant.

TACHINACPHAGUS, new genus

Female.—In my table to the earth's encyrtine genera running to *Parasyrpophagus* Girault but differs in being much more robust, the head is not strongly inflexed but only moderately so, from cephalic aspect a little wider than long, the frons broad. Marginal vein three and a half times longer than wide, subequal to the postmarginal. Thorax convex, the scutum and scutellum large, the axillæ united and with a short carina between them. Abdomen flat, as large as the thorax. One short ring-joint. Ovipositor just tipping the abdomen.

Tachinacphagus australiensis, new species. Genotype.

Female.—Length, 2. mm. Very dark metallic green, the wings hyaline, the venation subfuscous, the legs, scape, pleura and venter of thorax, reddish yellow; propodeum and axillæ slightly yellowish. Scape somewhat compressed, the pedicel subelongate, twice longer than wide at apex, subequal to funicle, which widens distad and is much the longest, the other joints short, 2 a little longer than wide, 5 and 6 a little wider than long, cupshaped; funicles 2 and 3 oval. Club no wider than the funicle which is submoniliform; club 3 longest, conic, as long as wide, 1 and 2 wider than long, distinctly so; club not half the length of the funicle, shorter than the scape, not obliquely truncate, the joints well separated. Mandibles moderately long, the first two teeth subequal, subobtuse, the third small, not half the size of the others which are of good size

but not especially long. Thorax very finely scaly reticulate, the scutum with obscure, scattered setigerous punctures, the head similarly sculptured and with scattered more distinct punctures. Scutellum like the scutum. Clothing of the scutum rather long yet soft, not dense nor erect. Scutellum glabrous on distal half. Lower face and cheeks with a few punctures. Hind tibial spurs double, unequal. The male is smaller but about the same, its antenna filiform, the club solid, no longer than funicle 7, the pedicel globular, funicle 1 thrice longer than wide, the following (6) joints of the funicle subequal, each over a half longer than wide. Flagellum uniformly clothed with rather short, soft hairs. A line of large punctures along the eyes on vertex as in the female.

From one male, eight females in U. S. National Museum, labeled "*Tachinaephagus zealandicus* Ashmead. Type No. 12721. Parasite from pupa of the larger locust parasite, Queanbeyan N. S. W. Lea. 2.92."

Types: Cat. No. 20892, U. S. Nat. Mus., five females on a card and a slide with male and female appendages. Cotypes in the Queensland Museum, one male, three females.

ZAOMOMMOENCYRTUS, new genus

Female.—In my table to the encyrtine genera runs to *Zaomencyrtus* Girault but like the species referred to *Anagyrus* except that the apical margin of the second tooth of the mandibles is concaved (so that the mandibles appear tridentate). The club is divided obliquely through the middle and is ovate. Frons moderately broad, subprominent. Habitus of *Epidinocarsis*.

Zaomommoencyrtus poeta, new species. Genotype.

Female.—Length, 1.50 mm. Stout, flattened. Lemon yellow, the vertex, scutum (except the lateral and caudal margins narrowly) and scutellum (except the same margins), deep orange yellow. Wings hyaline, the venation lemon. Face of pronotum, a small triangular sclerite just off the caudolateral corner of the scutum, propodeum across the meson out nearly as far as the spiracle and the bulla and the ventral half of the

distal half of the scape, black. Dorsum of abdomen more or less dusky along the meson. Dilation of scape great. Pedicel a little wider than long, larger than funicle 1; all funicle joints wider than long, 6 largest, larger than the pedicel; club about half the length of the funicle. Vertex densely scaly punctuate, the thorax and abdomen densely scaly. Axillæ a little separated. Pubescence very short, not dense. Scutellum long, shield-shaped. Abdomen depressed, circular, shorter than the thorax. Wings ample, the hairless line closed caudad obscurely by a paired line of cilia, with dense ciliation proximad of it. Venation not reaching the costa until the middle of the postmarginal vein, the marginal vein punctiform, the stigmal long and slender, over twice the length of the distinct postmarginal.

Described from a single female in the U. S. National Museum, reared from a supposed psyllid larva from under the bark of *Eucalyptus* (A. Koebele). Locality very probably Sydney.

Type: Cat. No. 20893, U. S. Nat. Mus., the female on a tag, the head and a fore wing on a slide.

AMISCOGASTER, new genus

Female.—Belongs to the Halticopterini and has the habitus of a small species of *Eurytoma* though not like *Eurytoma* in structure. Head (cephalic aspect) very slightly wider than long, the eyes bulging, hairy, ovate, the antennæ inserted between the middle of the face and the ventral ends of the eyes, filiform, 13-jointed with one ring-joint, the club 3-jointed, simple, the scape very short, a little over twice longer than wide (body, the bulla short), a little longer than the pedicel. Mandibles with two acute teeth and an inner truncation. Pronotum distinct, not very transverse linear. Parapsidal furrows punctate, not quite reaching the mesal edge of the advanced axillæ, the scutum with a distal tongue-like mesal prolongation between the large, obtuse axillæ. Scutellum convex, simple. Propodeum large, somewhat convexed, with a fine median ruga (several rugæ running irregularly from it to

make fine rugulosity), an oval spiracle of moderate size and cephalad with a foveate sulcus from it (the lateral margin of the sulcus a ruga-carina); no true lateral carina nor distinct neck. Abdomen narrower than the thorax, conic-ovate, pointed, the hypopygium prominent distad and covering the curved-up naked ovipositor; base of abdomen rimmed, the petiole transverse. Segment 2 of abdomen occupying somewhat over half the surface, gently incised at meson caudad, the others short but unequal, 3 longer than the others. Marginal vein linear but somewhat shorter than the submarginal, the stigmal short, with a distinct curved neck, the postmarginal slightly longer than it and thickened a little. Legs simple, the hind coxæ long. A peculiar chalcid.

Amiscogaster ruskini, new species. Genotype.

Female.—Length, 1.05 mm. Shining black, the head and thorax hispid hairy but not densely, the abdomen glabrous; scape, pedicel above and the legs (except proximal half of hind femur and the base of the hind coxa) whitish. Wings hyaline. Funicles 1–2 subequal, each a third longer than wide, 7 a little shorter. Fore wings with dense discal cilia.

From two females in the U. S. National Museum reared from a species of *Icerya*, February, 1901 (G. Compere).

Habitat: Columba, New South Wales, and as above.

Types: Cat. No. 12729, U. S. Nat. Mus., the females on tags, a head, fore wing and caudal tibia on a slide. This is the *Parasaphes iceryæ* Ashmead MS.

Dibrachys australia, new species.

Female.—Length, 0.70 mm. Dark, metallic green, the wings subhyaline, the scape, legs (except the coxæ and the femora above more or less) and the venation brownish. Body scaly-punctuate, finely so, the abdomen subglabrous. Clypeus produced, acutely incised at meson of apex and so divided into two equal, truncate, subquadrate teeth, divided at apex by a slit. Propodeum tricarinate, its neck short, no *spiracular sulcus*, the spiracle oblique, small, elliptical, a short distance from the margin. Segment 2 of the depressed abdomen long-

est, somewhat longer than 4, occupying not more than a fifth of the surface, its caudal margin entire, straight. Scutellum with but the faintest sign of a cross-suture near apex, the parapsidal furrows two-thirds complete from cephalad. Pubescence very sparse. Mandibles 4-dentate. Antennæ inserted much below the middle of the face, slightly below the ventral ends of the eyes, 13-jointed, the scape slender, the pedicel large, the rest slenderly clavate. Scrobes not distinct *per se* but lying in a very long-triangular, obtuse impression. Pedicel over twice longer than wide at apex, as long as the next four joints combined or longer; ring-joints grading into the funicle joints, the first shortest and narrowest, the second twice its size, still very transverse, half the length of funicle 1 and slightly narrower; funicle joints all wider than long, increasing gradually in length distad, 3 twice wider than long, 6 a little wider than long. Club ovate, its first joint quadrate and largest of the flagellum except the pedicel. No distinct terminal nipple. Postmarginal and stigmal veins of moderate length, subequal, each over half the length of the marginal, the latter less than half the length of the submarginal.

Three females in the collections of the U. S. Department of Agriculture and reared from the larvæ of *Carpocapsa pomonella* (Linnaeus), November 1 or January 11, 1909 ("11.1.09" Stokes).

Habitat: Glen Innes, New South Wales, and as above.

Types: Cat. No. 20466, U. S. Nat. Mus., two females on tags, a head, fore wing and pair of caudal legs on a slide. *Cotype*: In the Queensland Museum, a female on a tag.

Very similar to the North American (*Arthrolytus*) *Di-brachys pimplæ* (Ashmead) but the antennæ are lower on the face while the clypeus is incised.

***Sphegipterosema dubia*, new species.**

Female.—Length, 1.70 mm. Differs from the genotype in having no cross-suture on the scutellum, segments 3 and 4 of the abdomen are entire, 2 longest, occupying a fourth of the surface and with a small sinus caudad at meson, 3 not quite half the length of 2, more or less equal to 4; the coxæ are

concolorous, the rest of the legs and scape except at apex, reddish brown. Spiracle of propodeum reniform, the spiracular sulcus present, broken. Propodeum with a large neck, the abdominal petiole over twice longer than wide, subglabrous, delicately carinate along its lateral margin. Clypeus slightly concaved at apex. Tips of the tibiæ and the tarsi, pale. Abdomen conic-ovate, rounded above, much keeled beneath, acute at apex, there shortly acuminate. Postmarginal vein elongate, barely shorter than the marginal, the stigmal over a third shorter than the first yet very slender. Funicle 1 a half longer than wide, distinctly longer than the pedicel, 6 a little longer than wide. Antennæ inserted a little below the middle of the face. Like the genotype otherwise.

One female in the U. S. National Museum (A. Koebele).

Habitat: Australia.

Type: Cat. No. 20469, U. S. Nat. Mus., the female on a tag, the head, caudal legs, and a fore wing on a slide.

Perilampoides similis, new species.

Female.—Like *flavithorax* but the metathorax, upper occiput, middle of mesopleurum and proximal half of caudal coxa in the lateral aspect, also black, while the cross-stripe of the fore wing is reduced to an ovate spot appended from the thickened part of the submarginal vein and extending halfway across the wing. Abdomen all black. The postmarginal vein is somewhat longer than the marginal, the latter equal to the stigmal. Scutellum without obscure spots. Ring-joint quadrate, narrower than funicle 1, the latter, 3 and 4 subequal, twice wider than long, 2 and 5 subequal, somewhat wider than long. Like the description of the named species otherwise.

Four females in the U. S. National Museum (G. Compere).

Habitat: Swan River, West Australia.

Type: Cat. No. 20768, U. S. Nat. Mus., the females on tags and a slide bearing caudal tibia, a fore wing, and a head.

Tomocera australica, new species.

Female.—A half smaller than the genotype and differs notably in that the scattered dorsal thoracic pubescence is not long and conspicuous, but very short and differently disposed.

and the abdomen is entirely honey-yellow except just along the base narrowly and at apex above more broadly. Head and legs entirely honey-yellow except the clypeal area, which is green. Infuscation of the fore wing very light. Hind coxa with a fringe of "cobwebby" white pubescence. Funicle joints all somewhat wider than long, 5 largest. Mandibles tridentate. Hind tibial spur single. Abdomen with a wide petiole which is hidden by the neck of the propodeum.

From two females in the U. S. National Museum (G. Compare).

Habitat.—Swan River, West Australia.

Types.—Cat. No. 20470, U. S. Nat. Mus.; the female on tags, a head and three caudal tibiæ on a slide.

In the genus, the occipital margin is acute, the triangular head lenticular; the large pronotum (over half the length of the scutum) is subequal to the propodeum which is transverse-quadrangle and with a prominent neck which resembles a petiole.

***Stomatoceras carlylei*, new species.**

Female.—Length, 5 mm. In the table of Australian species runs to *longicornis*, but differs from that species as follows: Black, the legs bright red and the apex of the tegulæ; the fore wings are hyaline except for a transverse-rectangular fuscous area from the marginal vein; funicle 2 is only two-thirds longer than wide, 1 subquadrangle, shorter than the pedicel, 7 somewhat longer than wide. Segments of abdomen after 2 (except broadly along the meson of 3) scaly and with several rows of large punctures which are setigerous, 6 rugoso-punctate. Postmarginal vein somewhat longer than the marginal. Mesopleurum cross-striate. Otherwise as in *longicornis*.

One female on a tag in the U. S. National Museum, Toowoomba, Queensland (A. Koebele).

Type.—Cat. No. 20766, U. S. Nat. Mus., the above specimen and a slide bearing an antenna.

***Stomatoceras magnidens*, new species.**

Male.—Length, 4.50 mm. Black, the following parts red: Tegulæ, apex and bulla of scape, pedicel, funicles 1-3, base of

funicle 4, base rather broadly and apex narrowly of caudal femur and rest of the legs except caudal coxæ. Fore wings smoky from base of marginal vein to apex, but with a subquadrate hyaline area (distinct, large) from the cephalic margin just distad of the stigmal vein. Postmarginal vein slightly longer than the marginal. Characterized by the bidentate scutellum, the two teeth longer than usual and very distinct. Funicle 2 somewhat longer than wide, subequal to the pedicel, 1 somewhat shorter, longer than wide. A pair of distinct but short ridges at base of abdomen at meson, segment 2 polished except distad in the dorsolateral aspect; others coarsely scaly (at first not mesad) and with the large setigerous punctures. Hind femur punctulate, the fine teeth below along about distal three-fourths.

One male, Toowoomba, Queensland (A. Koebele).

Type.—Cat. No. 20767, U. S. Nat. Mus.; the male on a tag, a pair of wings and an antenna on a slide.

Stomatoceras rousseaui, new species.

Female.—Length, 4 mm. In the analysis of species runs to *nigriscapus*, but differs from its description as follows: The caudal legs are red except narrowly the ventrolateral edges of the tibiæ; the middle coxæ, the middle femur (except above at distal third more or less obscurely), and rest of middle legs except the tibiæ (except at each end) and the trochanters, are red; and the front legs are red except the distal third of the femur and the proximal two-thirds of the tibia; segments 1 and 2 of abdomen, sides and venter of 3, and venter of 4 and 5, red. Tegulæ red. Fore wings infuscated similarly, but the rectangular area from the marginal vein runs faintly across, widening caudad, and is more or less obscurely connected with the distal area to form a loop from the marginal vein around to cephalic margin distad of the postmarginal vein; the latter elongate, somewhat longer than the marginal, four times the length of the stigmal. Abdomen similarly sculptured. Scutellum distinctly bidentate. Funicle 1 is somewhat longer and 8 somewhat shorter than in *nigriscapus*. Teeth on hind femur below along distal two-thirds.

One female, minutien-mounted, Brisbane, Queensland, October 6, 1914 (H. Hacker).

Type.—In the Queensland Museum, Brisbane, the above female with a slide bearing a hind leg, a fore wing, and an antenna.

***Stomatoceroïdes bidens*, new species.**

Female.—Length, 4 mm. Like *rubripes* except that the first two pairs of legs are black except the tarsi, knees (more broadly red ventrad) and tips of tibiæ (more broadly ventrad), the tegulæ red at apex only; also the sides and venter of segments 2 and 3 of abdomen are red. Otherwise the same. Scutellum distinctly bidentate. The stain against the marginal vein is, perhaps, larger; only a trace of a distal stain (central and opposite the apex of the postmarginal vein). Teeth on hind femur along distal two-thirds. Funicle 1 over twice longer than wide.

One female, minutien-mounted, Brisbane, Queensland, October 27, 1914 (H. Hacker).

Type.—In the Queensland Museum, Brisbane, the above female and a fore wing and antenna on a slide.

***Eurytoma casuarinae*, new species.**

Female.—Length, 2.75 mm. In my table of species runs to *nelsonia*, but the abdomen is blood red, the mesal black stripe along proximal half (or to middle of segment 5), the caudal coxæ are black at proximal half above, the flagellum is black, the scape is red except above at apex, segment 5 of the abdomen is shorter (longer caudo-cephalad than proximo-distad). Median channel of propodeum consisting of a double row of coarse foveæ; postmarginal and stigmal veins short, subequal. Abdomen glabrous.

The male differs in that the petiole is over four times longer than wide and the abdomen all black except a large round area laterad (nearly all the middle of the lateral aspect except the borders broadly). The distal half of the scape above is black and ventrad distad of middle is a convexity. Funicle 1 about two-thirds longer than wide; club 2-jointed in both sexes.

Described from a single pair reared from galls on *Casuarina*. Stradbroke Island (Brisbane), Queensland, October, 1915 (H. Hacker).

Types.—In the Queensland Museum, the pair on tags and the flagellum of each sex and female hind leg on a slide.

Aceratoneuromyia australia, new species.

Female.—Length, 0.90 mm. Black, the wings hyaline, the knees, tibiae and tarsi honey-yellow. Body scaly, no pubescence except for long setae scattered over the pronotum (a few elsewhere). Marginal fringes of the fore wing not extremely short, somewhat longer than usual. Funicle joints wider than long, 1 largest, somewhat wider than long, 2 and 3 still wider (but shorter); club short-ovate, wider than the funicle, its joints much wider than long, 3 with a spicule at apex. Pedicel a little longer than funicle 1. Stigmal vein of moderate length. Mandibles bidentate, the second tooth obtuse.

Funicle joints in male each somewhat longer than wide, but 1 is subquadrate, a little shorter than the pedicel.

From one male, four females, associated with the fruit fly (*S. P. Lounsbury*),

Habitat.—West Australia.

Type.—Cat. No. 20597, U. S. Nat. Mus.; the specimens on tags, male and female heads and female caudal tibia on a slide.

Aceratoneuromyia, new genus.

Female.—Head a little longer than wide, shaped somewhat as in *Spalangia*, the antennae inserted much below the middle of the face, a very little distance below the ventral ends of the eyes, 11-jointed with three ring-joints, the second two of which are very short and thin. Suctum and scutellum simple. Propodeum with a long median carina only, the lateral and caudal margins narrowly carinated, the spiracle moderately large, round, cephalad. Petiole transverse-quadrate, the abdomen shorter than the thorax, its dorsum sunken. Hind tibial spur single.

Male.—Similar, but the scape is swollen, the funicle 4-jointed, the club 3-jointed.

Genotype.—*A. australia* Girault, just described.

Encyrtocephalus simplicipes Ashmead. Genotype.

Pseudorileya Girault is a synonym. The genotype (*simplicipes*) differs from *albiclava* in having the cephalic margin of the propodeum broadly black between the spiracles, the funicle is black or nearly, there is only a round hyaline dot in the large infuscation against the stigmal vein, the abdomen dorsad is depressed, the caudal margins of the segments straight, segment 2 largest, occupying nearly a third of the surface. Scutellum distad less punctate only, the sculpture not sharply demarked. From the type in the U. S. National Museum, a female.

SYNONYMS

Omphalomorpha Girault is *Euderus* Haliday; there are two ring joints. *Aplastomorpha pratti* Crawford equals *australensis* Girault equals *Meraphorus vandinei* Tucker equals *Neocatolaccus vandinei* (Tucker); cosmopolitan.

Propachytomoides, new genus.

Female.—Differs from *Podagrionella* in bearing a 2-jointed antennal club, the antennæ 12-jointed with one ring-joint

Propachytomoides semialbiclavus, new species. Female. Genotype.

Length, 2 mm., excluding the ovipositor, which is about as long as the subglobular abdomen.

Dark metallic purple, the scape except at apex, middle knees, tips of middle tibiæ, and petiole of the abdomen, reddish brown. Basal joint of hinder two pairs of tarsi whitish, also about the distal half of the club (joint 2 except at base). Hind femur with ten teeth beneath, 1, 4, 6, 8 and 9 largest, 2 and 3 smallest, but not much smaller than 10. Fore wings with a very conspicuous, solid purple stripe across from nearly the distal two-thirds of the marginal vein, the stripe incomplete for a quarter of the way from margin to margin. Postmarginal vein somewhat over twice the length of the very short stigmal, the venation black. Genal suture delicate, the head, thorax, and hind femur finely scaly. Antennæ inserted in the middle of the face, like those of *Podagrion* in shape.

Petiole twice longer than wide. Scutellum distad of its cross-suture, glabrous. Propodeum with delicate, longitudinal rugæ except broadly laterad, one of these rugæ median and which meets at basal third a broad semi-circular carina; there is also a carina from caudad on each side of the petiole, running nearly to the semi-circular carina. Postscutellum glabrous, the suture between it and the scutellum punctate. Funicle 1 longest, a half longer than wide, 2 and 3 a little shorter, subequal to the pedicel, 6 quadrate, 7 a little wider than long. Ring-joint normal. Club nearly as long as the three preceding joints united. Abdomen showing a very delicate scaliness. Cephalic tibiæ more or less reddish. Ovipositor reddish (the valves absent in this specimen).

A female, forest uplands (Hawkesbury River), November 3, 1914.

Habitat.—Brooklyn, New South Wales.

Type.—In the Queensland Museum, Brisbane, the specimen on a tag, an antenna on a slide.

There is a faint dusky stripe across the fore wing from about the middle of the submarginal vein. Petiole with longitudinal carinæ. Propodeum, laterad of the spiracle, with a sharply gouged-out narrow sulcus (dorso-laterad).

***Dinoura eucalypti*, new species.**

Female.—Very similar to *cyanea*, with the type of which I compare it, but differing as follows: Somewhat more robust; a little more of the abdomen is red; the caudal femora are entirely red except the proximal end rather broadly and slightly at apex. Distal funicle joint somewhat longer than wide, the basal over twice longer than wide; apical joint of club red. "Propeller blades" of ovipositor valves larger than in *cyanea*.

Two females reared from a chalcid in brachyscalid galls on *Eucalyptus* (A. Koebele).

Habitat.—Sydney, New South Wales.

Types.—Cat. No. 20887, U. S. Nat. Mus.; two females on tags, the flagella on a card.

Parachrysomalla secunda, new species.

Female.—Agrees with the description of the genotype, but somewhat smaller, the fore wings are lightly dusky from the band of the submarginal vein distad to apex, the scape is dusky dorsad, the pedicel black, the ring-joint pale and a little longer than wide, funicle 1 is twice longer than wide, 2 a half longer than wide, 3 somewhat shorter than 2, 4 nearly quadrate. Club subequal to funicle 1 in length. The scutellum differs in bearing a carina across a short distance before the apex, while the pair of median carinæ on the postscutellum are very delicate, more or less obscure. Only the cephalic knees are yellow, the other femora black to their tips. Abdomen somewhat compressed, as long as the rest of the body.

The male is similar in color, the abdomen depressed (antennæ missing).

One male, four females, on two cards in the U. S. National Museum, marked "91. From turpentine galls."

Habitat.—Flemington, New South Wales (and as above).

Types.—Cat. No. 12718, U. S. Nat. Mus.; as above with a slide bearing female heads, caudal legs, and a fore wing.

This is the *Cecidoxenus nigrocyanus* Ashmead MS. of the Miscogasteridæ. It is a perilampid.

Thaumasura westwoodi, new species.

Female.—Length, 8 mm., excluding the ovipositor, which is extruded for a length slightly over twice that of the body, a third or more longer than the stylus above it.

Much like *terebrator*, but the antennæ are entirely black except joints 4 and 5 of the funicle, the femora, tibiæ, and tarsi red except a large oval spot above laterad near dorsal margin at distal half of cephalic and caudal femora (on the latter a much smaller area on the mesal aspect), and the caudal tibiæ just below the knees. Also the antennæ differ from those figured for the genotype in that the pedicel in the latter is barely a half the length of funicle 2, while here it is plainly two-thirds the length of funicle 2; also the club joint is larger than the joint preceding it, shorter in *terebrator*. A triangular

fuscous patch from the apex of the stigmal vein. Plate at apex of scutellum entire. Funicle 1 distinctly wider than long, 3 nearly thrice longer than wide.

A female in the U. S. National Museum formerly identified by Ashmead as *terebrator* and marked "27."

Habitat.—South Australia.

Type.—Cat. No. 20894, U. S. Nat. Mus.; the specimen on a card, an antenna on a slide.

Aressida Cameron and *Agamerionella* Girault are synonyms of *Thaumasura*.

The following new names are proposed: For *Paranusia* Girault the name *Ananusia*; for *Eurytoma acaciae* Girault the new name *E. australia*.

The following genera are synonyms of *Sympiesis*: *Notanisomorphella* Girault, *Notanisomorphomyia* Girault, and *Pseudopheliminus* Girault. *Asympiesiella superbus* Girault is a *Sympiesis*. The genus *Paromphale* Girault is correctly described and placed, but is closely allied with *Thripoctenus* Crawford, which is incorrectly described and is not a tetrastichine. But the former bears dentate mandibles, two ring-joints, and the antenna is clothed with long hairs.

Date of publication, October 15, 1917.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar and
Frederick Knab.

Subscriptions and matter for publication should be addressed to Harrison
G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the
manuscript.

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INSECUTOR INSCITIZÆ MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. V

OCTOBER-DECEMBER, 1917

Nos. 10-12

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NEW GENERA OF AMOBIINÆ

(Diptera)

By CHARLES H. T. TOWNSEND

The Sarcophagidæ proper include the two subfamilies Sarcophaginæ and Amobiinæ, each separable into two tribes, respectively: Sarcophagini, Brachicomini; and Amobiini, Tephromyiini. To these may probably best be added the *Miltogramma* and *Metopia* types as subfamilies, since these forms are more closely related to the *Sarcophaga* type than to any other. Constituted thus, the family Sarcophagidæ may be quite easily distinguished from the four muscoid families with which it is most nearly allied.

The Muscidæ differ on general metallic coloration, combined with weaker abdominal macrochætæ, usually no wrinkle at bend of fourth vein, absence of incubating uterus, and slight development of dorsopharyngeal sclerite I (first-stage maggot).

The Stomoxydidæ differ on same characters as preceding with exception of the first. The uterovagina functions in *Viviparomusca* to incubate one egg at a time.

The Calirrhoidæ differ on generally narrowed or strongly carinate facial plate, stronger macrochætæ, elongate legs, tubular to gutlike incubating uterus, and much reduced cephalopharyngeal skeleton I.

The Dexiidæ differ on the cut-off and scarcely prominent epistoma, stronger macrochætæ, long legs, tubular to ribbonlike uterus, and reduced cephalopharyngeal skeleton I.

Aside from the *Miltogramma* and *Metopia* types, which differ on usually narrower facial plate, V-like uterus, weakly developed or vestigial dorsopharyngeal sclerite, and a variety

of supporting characters, the subfamilies and tribes of Sarcophagidæ may be separated as follows:

1. Vibrissal axis closely approximating antennal axis in length; clypeus depressed, the epistoma warped forward from plane of clypeus, the face dished..... (Sarcophaginæ) 2
 Vibrissal axis usually shorter than antennal axis; clypeus not depressed, the epistoma not appreciably warped, face not conspicuously dished..... (Amobiinæ) 3
2. Clypeus broad and more or less elongate; facialia more or less flattened, but always showing a distinct convexity and thus contrasted with clypeus, leaving a distinct foveal sinus along their inner edge..... Sarcophagini
 Clypeus very broad and usually shortened; facialia flattened as though ironed out, their plane gradually warped out and forward from plane of clypeus, leaving no marked foveal sinus, or if sinus is distinct the facialia show no convexity..... Brachicomini
3. Clypeus narrowed and elongate; facialia showing convexity,
 Amobiini
 Clypeus broad and shortened; facialia showing no convexity, appearing ironed out, but their plane nearly in plane of clypeus and with a foveal sinus along their inner edge..... Tephromyiini

The genera of Sarcophagini are treated in another paper (Proc. Biol. Soc. Wash.).

The genera of Brachicomini are: *Brachicoma* Rdi., *Eubrachycoma* T., *Punaphyto* T., *Microcerella* Mcq., *Disjunctio* Pand., *Wohlfahrtia* BB., *Euparaphyto* T., *Melanophyto* T., *Pierretia* RD., *Hartigia* RD. Despite its anomalous female reproductive characters, *Eurychaeta* BB. (*Helicobosca* Bezzi) comes here on external adult characters.

The genera of Amobiini are: *Amobia* RD., *Amobiopsis* T., *Macronichia* Rdi., *Paramacronychia* BB., *Dolichamobia* T., *Cistudinomyia* T., *Metoposarcophaga* T., *Raimondia* T., *Emblemasoma* Ald., *Harpagopyga* Ald., *Glaucosarcophaga* T., *Acridiophaga* T., *Blaesoxipha* Lw., *Johnsonia* Coq., *Rafaelia* T., *Neophyto* T., *Camptops* Ald., *Oppiopsis* T. (syn. *Harbeckia* Ald.), *Xenoppia* T. (syn. *Camptopyga* Ald.), *Notochaeta* Ald., *Sthenopyga* Ald., *Angiometopa* BB., *Dexosarcophaga* T., *Chloronesia* T. To these may be added the following new genera:

Acanthodotheca, new genus.

Differs from *Sarcophaga* as follows (omitting subfamily and tribe characters above given): Facialia considerably flattened, but showing convexity. Vibrissæ well constricting facial plate. Proboscis not as long as head height. Arista plumose a little over halfway. Male vertex hardly one-half eye, female vertex hardly three-fifths eye. Frontal bristles diverging obliquely two below base antennæ. Female without proclinate fronto-orbitals. Male frontalia narrowed. Ocellars present in both sexes. Parafacialia half as wide as clypeus, with row of hairs which are mostly bristly. Cheeks a little over one-third eye-length in both sexes. Postsuturals 3. Preacrostichals present. Costal spine strong. Squamæ longer than wide. Male hind tibiæ not villous. Male hypopygium not very large. Female hypopygial tergum entire, second hypopygial sternite elongated into a broad sheath densely covered with prickles. Genotype, *Sarcophaga prohibita* Ald., Sarc. and Allies, 133 (1916).

Blæsoxiphotheca, new genus.

Differs from *Sarcophaga* as follows: Female. Proboscis not as long as head-height. Arista plumose halfway. Eyes proportionately large in front view. Frontals diverging obliquely two below base antennæ. Cheeks a little over one-third eye-length. Three postsuturals, preacrostichals present. Strong pair of discal scutellars. Large and strong median marginals on second and third abdominal segments. Apical cell terminating farther from wing-tip. Female hypopygial tergum entire; third hypopygial sternite modified into a recurved subcylindrical but tapered sheath rounded apically and obliquely shaved off dorsally, in which lies the larvipositor. Genotype, *Blaesoxiphotheca caudata*, n. sp., being female described by Aldrich as *Sarcophaga coloradensis*, Sarc. and Allies, 140 (1916). Holotype, No. 21582, U. S. Nat. Mus.

The holotype of *coloradensis* Ald. is a male and belongs to *Acridiophaga*. Its coloration as well as its structural characters indicate that it does not belong with the female here named *caudata*.

Eleodiomyia, new genus.

Differs from *Sarcophaga* as follows: Facialia considerably flattened, vibrissæ constricting facial plate. Proboscis about two-thirds to three-fourths head-height. Palpi greatly swollen apically in female, rather elongate but not so swollen in male. Arista plumose a little over halfway. Male vertex about or nearly one-half eye, female vertex fully as wide as eye. Female parafrontalia about as wide as frontalia. Frontals diverging two below base antennæ. Ocellars present in both sexes. Parafacials with irregular double row of fine hairs. Female cheeks one-third eye-length, male cheeks three-fifths same. Three postsuturals, preacrostichals present. Mesonotum with flattened disk. Approximated pair of discal scutellars. Strong costal spine. Cubitus right-angled V-like, far from hind margin. Squamæ much longer than wide. Hind tibiæ of male not villous. No median marginals on second segment in either sex. Male hypopygium small, winged or narrow forceps spined exteriorly. Female hypopygial tergum entire, flattened. Genotype, *Sarcophaga eleodis* Ald., Sarc. and Allies, 128 (1916).

Scarabæophaga, new genus.

Differs from *Sarcophaga* as follows: Male vertex three-fourths eye, female vertex as wide as eye. Frontalia broader than parafrontals in both sexes, not narrowed. Parafacialia a little narrower than clypeus. Squamæ much longer than wide. Hind tibiæ of male not villous. Male forceps broadened before tip, ending in apical spine. Female hypopygial tergum excised, showing broad vertical slit bordered with bristles and a few bristly hairs next same, the tergum divided on median line into two lobes. Genotype, *Sarcophaga utilis* Ald., Jour. Econ. Ent., viii, 151 (1915).

Raviniopsis, new genus.

Differs from *Sarcophaga* as follows: Female. Proboscis shorter than head-height. Arista plumose to tip. Parafrontalia conspicuously broader than frontalia. Frontals descending one below base antennæ, weak and short. The two pro-

cline fronto-orbitals weak and short, the reclinate one strong. Parafacialia fully as broad as clypeus. Cheeks less than one-half eye-length. No facio-orbitals, the parafacialia with only microscopic pubescence. Only two postsuturals; two strong postacrostichals. Costal spine absent. First vein bristled about halfway. Squamæ longer than wide. No median marginals on second abdominal segment, short weak pair on third segment. Female hypopygial tergum excised, bordered with bristles. Genotype, *Raviniopsis aurea*, n. sp.

• **Raviniopsis aurea**, new species.

Length of body, 6.5 to 9 mm.; of wing, 5 to 6.5 mm. Two females: Piura, Peru, June 19, 1910 (Townsend); and Alhajuelo, Panama, April 10, 1911 (Busck). Holotype, No. 21583, U. S. Nat. Mus.; TD 3902, Piura, Peru.

Antennæ and palpi blackish, frontalia light brown. Head, whole body, and femora silvery pollinose with a pronounced golden shade. The marmorations of abdomen show as a narrow median line, a heavy spot laterally on each segment approximated to hind border, another approximated to front border between the lateral one and the median line. Hypopygium reddish-yellow. Tegulæ watery-white. Legs brownish-black.

Sarcophodexia, new genus.

Differs from *Sarcophaga* as follows: Male. Proboscis shorter than head-height. Arista plumose a little over halfway. Eyes large in front view. Outer verticals distinctly stouter but little longer than occipital fringe. Parafacialia little over half as wide as clypeus, with short bristles on outer half or so. Cheeks about one-half eye-length. A strong pair of postacrostichals, and a strong pair of discal scutellars. Squamæ longer than broad. Hind tibiæ not villous. No median marginals on second abdominal segment. Genotype, *Sarcophaga hamata* Ald., Sarc. and Allies, 272 (1916).

Amblycoryphenes, new genus.

Differs from *Sarcophaga* as follows: Female. Proboscis little over half head-height. Eyes large. Vertex about two-

thirds eye. Parafrontalia gently narrowing posteriorly, a little narrower than frontalia. Frontals descending obliquely two below base antennæ. Parafacialia less than half as wide as clypeus, with row of bristly hairs doubled below. Cheeks little over one-fourth eye-length. Three postsuturals, preacrostichals present. Squamæ longer than wide. No median marginals on second segment, strong marginal row on third segment. Hypopygial tergum entire. Genotype, *Sarcophaga amblycoryphæ* Coq., Proc. Ent. Soc. Wash., vi, 187 (1904).

Notochætopsis, new genus.

Differs from *Sarcophaga* as follows: Proboscis shorter than head-height. Eyes large. Vertex in both sexes about two-fifths eye, the front narrowing conspicuously in front of ocellar area. Frontals descending obliquely two below base antennæ. Outer verticals developed in both sexes, but short. No proclinate fronto-orbitals in either sex. Ocellars present. Parafacialia of female half as wide as clypeus, those of male two-thirds same; with single row of bristly hairs. Cheeks about one-third eye-length in both sexes. Three postsuturals, preacrostichals present. Lateral scutellars two. Squamæ longer than wide. Hind tibiæ of male not villous. No median marginals on second segment; third segment with strong median marginals. Hypopygial tergum of female entire; second and third hypopygial sternites forming a short broad sheath to the larvipositor, the third showing thin and translucent. Genotype, *Sarcophaga masculina* Ald., Sarc. and Allies, 130 (1916).

Camptopsis, new genus.

Differs from *Sarcophaga* as follows: Female. Arista short-plumose less than halfway. Eyes very large. Vertex about three-fourths eye. Parafrontalia almost as wide as frontalia; frontals not descending below base antennæ. Outer verticals very short, stouter but scarcely longer than occipital fringe. Only one proclinate fronto-orbital. Ocellars weak. Parafacialia scarcely one-third as wide as clypeus, with only a few microscopic hairs on upper extent in continuation of row on parafrontals. Cheeks hardly over one-seventh eye-length.

Sternopleurals 2, postsuturals 3. Lateral scutellars 2, apical present, no discal. First vein bristled on about basal half. Apical cell ending but little before wing-tip, open. Cubitus right-angled, near border, with very slight wrinkle. Hind cross-vein removed rather over its length from cubitus. Second segment with marginal row of very short weak bristles, except the strong ones at sides. Third segment with marginal row of long and strong bristles. Hypopygial tergum entire. Genotype, *Camptopsis miamensis*, n. sp.

Camptopsis miamensis, new species.

Length of body, 5.75 mm.; of wing, 5 mm. One female, Miami, Florida, November 18, 1908 (Townsend). Holotype, No. 21584, U. S. Nat. Mus.; TD 997.

Silvery-ash pollinose. Frontalia and third antennal joint light brown. First two antennal joints and palpi pale rufous, the palpi tipped with blackish. Second abdominal segment narrowly rufous on hind margin, third segment more broadly so, fourth segment and hypopygium wholly rufous. Legs rufous, tarsi black. Tegulæ whitish.

The genera of Tephromyiini are: *Tephromyia* BB., *Protophoxia* T., *Opsophyto* T., *Sarcophagaria* Park., *Sarcophila* Rdi., *Listeria* RD. To these may be added the following:

Opsophytopsis, new genus.

Differs from *Sarcophaga* as follows: Female. Arista pubescent on basal half. Eyes large. Vertex only a little over one-half eye. Parafrontalia nearly as wide as frontalia. Frontals diverging obliquely one below base antennæ. Para-facialia about half as wide as clypeus, with broken row of bristly hairs. Cheeks about one-third eye-length. Three postsuturals; preacrostichals present. Cubitus right-angled. No median marginals on second segment; strong ones on third segment. Hypopygial tergum entire. Genotype, *Opsophytopsis insularis*, n. sp.

Opsophytopsis insularis, new species.

Length of body, 7.5 mm.; of wing, 5.5 mm. One female, Albemarle Island, Galapagos, January 18, 1899. Holotype, No. 21585, U. S. Nat. Mus.

Blackish, silvery-ash pollinose. Third antennal joint sub-rufous on inside at base. Palpi and frontalia brown. Sides of second and third abdominal segments broadly rufous, anal segment mostly rufous. A median vitta blackish, and a lateral one on each side. Between the lateral vittæ the second and third segments are blackish. Hind margins of segments blackish or brown. The vittæ of abdomen divide the pollen into four silvery spots on second and third segments, less conspicuously so on anal segment. Hypopygium rufous. Legs brown, the tibiæ lighter. Tegulæ nearly white.

Tephomyiella, new genus.

Differs from *Sarcophaga* as follows: Female. Arista short-plumose halfway. Eyes large. Vertex about three-fourths eye. Parafrontalia nearly as wide as frontalia. Frontals diverging obliquely two below base antennæ. Parafacialia about one-third as wide as clypeus, with row of bristly hairs. Cheeks about one-third eye-length. Postsuturals 3; pre-acrostichals present. One strong postacrostichal. Two lateral scutellars. Cubitus right-angled. No median marginals on second segment, weak marginal row on third segment. Hypopygial sternite modified into a short spatulate sheath to larvipositor, no longer than first sternite and about as broad at base as latter is at junction therewith. Genotype, *Tephromyiella frankliniana*, n. sp., being female described by Aldrich as *Sarcophaga atlanis*, Sarc. and Allies, 102 (1916). Holotype, No. 21586, U. S. Nat. Mus.

The structural characters indicate that this can not be the female of *atlanis* Ald. It is even quite doubtful if *frankliniana* is congeneric with *atlanis*. The latter has median marginals on second abdominal segment, 4 pairs of postacrostichals, flat disk to mesonotum, hind femora with median longitudinal row of bristles, third antennal joint short and narrowed, tegulæ mostly dirty fuscous; strongly contrasting with *frankliniana*, which has no median marginals on second segment, only 1 pair of postacrostichals, no flattening of mesonotum, hind femora without vestige of median row of bristles, third antennal joint long and broad, tegulæ white.

In conclusion it may be pointed out that the Sarcophagini present affinities with the Muscidæ and Stomoxydidæ; the Brachicomini with the *Miltogramma-Metopia* types and Muscidæ; the Amobiini with the Calirrhoidæ and Dexiidæ; and the Tephromyiini with the *Miltogramma-Metopia* types and Calirrhoidæ.

NEW AMERICAN MOSQUITOES

(*Diptera, Culicidæ*)

BY HARRISON G. DYAR AND FREDERICK KNAB

Aedes zoösoptus, new species.

Head and anterior half of mesonotum with dense scales of brassy yellowish, showing a faint brownish shade near the middle; posterior portion marked with dark brown, which begins squarely, is divided by a pair of whitish lines and reaches the root of wing. Abdomen black above with basal segmental white bands, divided into a small median portion and larger white triangular lateral patches; venter with the segments black at apices and white at bases, evenly divided. Wing scales wholly dark brown, dense on costa. Proboscis black. Legs bluish black scaled; femora with apical white spots, the hind femur with the basal half white; hind tarsi rather broadly white-ringed at the bases. Claws toothed.

Type, female, No. 21558, U. S. Nat. Mus.; Kerrville, Texas, August 19, 1909 (F. C. Pratt).

The species seems allied to *fluviatilis* Lutz and, like it, probably breeds in rock-holes along streams.

Aedes gonimus, new species.

Head and thorax with dense scales of brassy yellowish, the mesonotum with two very narrow, parallel, well separated brown lines, running from the front margin to the antescutellar space. Abdomen black above, with broad basal segmental white bands, scarcely widening on the sides, narrower posteriorly; venter white, with narrow apical segmental black bands. Wing-scales wholly dark. Proboscis black. Legs black, all

the femora whitish beneath nearly to the tips, without conspicuous knee-spots. Claws toothed.

Types, four females, No. 21559, U. S. Nat. Mus.; Kerrville, Texas, June 20, 1907, "in a deep canyon; bites fiercely" (F. C. Pratt).

Aedes niphadopsis, new species.

Head with white and brown scales intermixed, the white predominating on vertex and sides below; mesonotum with dark brown scales dorsally, a little intermixed with white, especially in narrower sublateral posterior lines, predominating on the sides and around antescutellar space. Abdomen black above, with very broad white basal segmental bands, more or less diffused and tending to form a dorsal white stripe, often distinct; last segment nearly wholly white; venter gray-white, with medio-ventral black spots at the bases of the segments. Legs black, the femora white nearly to tips, tibiæ and even the first two tarsal joints with gray-white scales predominating. Wing-scales black, with many white ones intermixed on costa, first vein and the veins bordering the basal cell. Proboscis black with a sprinkling of white scales. Claws toothed.

Types, three females, No. 21560, U. S. Nat. Mus.; Salt Lake County, Utah, April 10 and 15, 1914 (C. T. Voorhies).

Aedes epinolus Dyar and Knab.

This was described from females from Peru (Ins. Insc. Mens., ii, 61, 1914). We have a male before us from Guayaquil, Ecuador (Dr. F. Campos R.).

Genitalia.—Side pieces long, cylindrical, with a triangular basal lobe, bearing a group of setæ with tubercular bases. Clasp filament simple, but swollen at the basal third. Harpes conical, with small apical hooks. Unci cylindrical, thin, the tips incurved and approximate. Harpagones with slender columnar curved stems, finely pilose within; filament narrow, curved, pointed and with a sharp retrose spine on one side.

Aedes innuitus, new species.

Head and mesonotum black, in the male specimens before us without scales, but the setæ long and unusually abundant;

in the females sparse dark brown scales persist, replaced by white ones low down on the sides. Abdomen above with dark brown, not black, scales and narrow basal segmental whitish bands. Legs black, the femora with whitish scales especially beneath. Wings hyaline, the veins dark brown, denuded in our specimens.

Genitalia.—Side pieces about three times as long as wide, tips rounded. Clasp filament slender, uniform, with long inserted terminal spine. Apical lobe of side piece conical, small, rugose, with few fine setæ; basal lobe high-conical, setose, the setæ long on the basal aspect, without a spine. Harpagones long, narrow, setose at base, narrowed at apical third; filament long, sickle-shaped, with a double angular membrane at the base as in *tahoënsis* and *altiusculus*. Harpes peculiarly modified, tubular, with angular open ends and thickened rims. Unci large, cylindrical, the tips pointed and inbent. Basal appendages moderate, with seven stout setæ.

Types, two males and two females, No. 21561, U. S. Nat. Mus.; Greenland (through Dr. F. Meinert). Two fresher specimens are very similar, but we do not venture to identify them positively without the male; Kangerdlooksoah, Inglefield Gulf, Greenland, August 9, 1908 (C. C. Craft).

These specimens agree in a general way with Zetterstedt's diagnosis of his *Culex nigripes* from Lapland. Possibly they are the same species; but with the generally local distribution of these *Aedes*, we cannot make that assumption. The male genitalia of *nigripes* are unknown.

Theobald (Mon. Culic., ii, 93, 1901) gives the distribution of *nigripes* as "Lapland; Greenland; Virgin's Bay, Alaska (T. Kincaid); Hudson's Bay (Walker); Kashmir, India, 13000 feet." He gives the synonymy thus:

Culex nigripes Zetterstedt (Lapland).

- impiger* Walker (Hudson's Bay).
- implacabilis* Walker (Hudson's Bay).
- incidens* Thomson (?) (California).
- var. *sylvæ* Theobald (England).

Blanchard (Les Moust., 345, 1905) copies this synonymy, omitting the query after *incidens* and adds the locality "France;" but on page 391, he removes *incidens* to *Theobaldinella* (= *Culiseta*), its correct position.

As to *impiger* and *implacabilis*, they were described from females, evidently in bad condition and therefore undeterminable. Felt (Bull. 79, N. Y. State Mus., 316, 1904) identified *impiger* with specimens from northern New York, of which he had all stages. This was a somewhat bold action, as we have no knowledge whether the mosquito fauna of Hudson's Bay is identical with that of the Adirondacks of New York or not; but we have followed this restriction, and placed the unrecognizable *implacabilis* with it as a synonym (Howard, Dyar and Knab, Mosq. N. Am. and W. Ind., iv, 755, 1917).

Concerning *sylvæ*, F. W. Edwards says (The Entomol., 1912, p. 220) that it is probably *nemorosus*, a species with normal thoracic setæ. Edwards also remarks upon *nigripes*, saying: "It is extremely similar [to *nemorosus*], but the scales of the head and thorax are all very deep brown, except for a few in front of the wing base, which are whitish." Edwards does not mention the conspicuous bristles; but probably the specimens examined were misidentified. They were not types.

Theobald never accepted the separation of the American forms. His latest statement (Mon. Culic., v, 311, note, 1910) was: "American specimens *may* differ [from *nigripes*], but I cannot see a single character to separate them and do not believe they are separate." By American specimens, he presumably meant those before him from Hudson's Bay, Canada, and Virgin's Bay, Alaska. We are not familiar with the Canadian specimens in the British Museum, but neither Walker in describing *impiger* and *implacabilis*, nor Kirby in describing *punctor*, all from the same Hudson's Bay locality, make any mention of the long thoracic hairs, which would certainly have attracted their attention if they had been present. These bristles are not easily abraded. Both Giles and Theobald re-describe the types of *punctor* and make no mention of the long black bristles. In his description of *nigripes*, Theobald does specifically mention these, showing that it was a char-

acter which would draw his attention when present. It is probable that these hirsute forms occur only in the extreme north. A specimen before us from Labrador (St. Lewis Inlet, Labrador, July 12, 1906, through Prof. C. W. Johnson) does not show the character.

We have a good series from Virgin's Bay and elsewhere in Alaska. Two species are represented, a smaller one with the mesonotum all dark brown scaled, and a larger one with the mesonotum yellowish scaled with paired dark brown lines, the latter probably *borealis* Ludlow. There are no males for exact determination; but neither species could possibly be confused with *nigripes*, as the mesonotum is furnished with normal short setæ, entirely unlike the long dense ones described for *nigripes* and found also in our *innuitus*. It seems probable that Theobald, having included southern specimens among the true *nigripes*, based his conception of the species on these, or to include these, and so could no longer distinguish the Canadian and Alaskan specimens. That he did so is proved by his having described English *nemorosus* as variety *sylvæ* of *nigripes*. Blanchard's record from France is doubtless also *nemorosus*.

BRABANTIA RHIZOLEUCA REDESCRIBED

(*Lepidoptera*, *Noctuidæ*, *Acronyctinæ*)

By HARRISON G. DYAR

Among some South American Notodontidæ recently described by Lord Rothschild, a noctuid has crept in. It may be easily recognized by the admirable photographic figure. The following synonymy of the species is at present known to me:

Brabantia rhizoleuca (Brabant).

Pseudacontia rhizoleuca Brabant. Bull. Soc. Ent. France, 330, 1912.

Brabantia Dyar, Ins. Ins. Menstr., 1, 60, 1913.

Dyasia melanoleuca Rothschild, Nov. Zool., xxiv, 262, pl. iii, f. 21, 1917.

THE GENUS *CULEX* IN THE UNITED STATES

(Diptera, Culicidæ)

By HARRISON G. DYAR AND FREDERICK KNAB

The small species of *Culex* of the southern United States, belonging to the groups *Melanoconion* and *Mochlostyrax*, were somewhat uncritically dealt with by us in the monograph,¹ due to our limited material and small knowledge of the forms in question and to the press of work caused by the multiplicity of species before us at that time. The species may be advantageously considered disconnectedly from the mass of tropical forms.

A number of errors have crept into our work, which we will first correct. In all these species the proboscis of the female is moderately swollen at the tip. In dried specimens the member becomes shrunk and sometimes distorted, so that the character is often far from evident, especially when the swelling is normally not very prominent. We were led by our observations on incomplete material to classify *abominator* and *peccator* under the heading "proboscis of female not swollen at tip," thereby introducing two serious errors. Again, *erraticus*, *floridanus*, and *agitator* were based upon larvæ. In our zeal to complete our work, we associated wrong adults in some cases. The adults assigned to *erraticus* are correct, but we did not recognize that they are identical with *abominator*, having already placed that species wrongly in regard to the proboscis. To *floridanus* we wrongly assigned adults of *incriminator*, separating them from our other *incriminator* by "eyes not white margined," not realizing that the difference was due in part to the condition of the specimens and in part to the deceptive nature of this character. The white margin is formed by scales, which may be abraded, or appear white or black according to the incidence of the light. To *agitator* we assigned adults of another Cuban species belonging to *Melanoconion*, whereas *agitator* is strictly a *Mochlostyrax*.

¹ Howard, Dyar and Knab, The Mosq. N. and Cent. Am. and W. Ind., iii, 1915.

In respect to the larvæ, *abominator* is identical with *erraticus* and *agitator* with *floridanus*, though, through minor errors, we placed them separately in the tables.

Other corrections apply to *abominator*, *egberti*, and *mastigia*, which were described as possessing white abdominal bands. In *abominator* and *egberti* these consist of white central spots with a few scattered scales, and should be described as dotted; in *mastigia* the appearance of bands is illusory in the female, being due to the visibility of the pale integument and the pale bristles, and vanishes under sufficient magnification. The male in this species has distinct abdominal bands. Again *egberti* and *mastigia* are separated on the deceptive character of the white eye-margin, referred to above, which we would discard as unreliable.

This is a rather formidable series of mistakes in so small a group of species and naturally involves some changes in synonymy. We believe that the species are here placed on reliable characters.

The genus *Culex* as a whole, as it occurs in the United States, may be divided into subgenera on the characters afforded by the male genitalia. From this standpoint, *Deinocerites* represents only a section of *Culex*, while, on the other hand, *Culicella* and *Climacura* are plainly distinct genera, the former nearer to *Culiseta* than to *Culex*. We include them all in the following review:

TABLE OF SUBGENERA OF CULEX BY THE MALE GENITALIA

- | | |
|---|---------------------|
| 1. Unci undivided, conical..... | <i>Climacura</i> |
| Unci divided into paired plates..... | 2 |
| 2. Harpes simple, few-toothed..... | <i>Culicella</i> |
| Harpes with numerous terminal spines..... | 3 |
| 3. Harpes broad, membranous, without basal branch; unci lacking the second plate by degeneration..... | <i>Neoculex</i> |
| Harpes and unci not so formed..... | 4 |
| 4. Harpes with a tuft of spines at tip..... | <i>Culex</i> |
| Harpes comb-shaped, the spines in a single row..... | 5 |
| 5. First plate of the unci elongated and spatulate..... | <i>Deinocerites</i> |
| First plate of the unci triangular..... | 6 |

6. Side pieces somewhat swollen; clasp filament roundedly enlarged at tip.....*Mochlostyrax*
 Side pieces much swollen; clasp filament distorted and tufted,
Melanoconion

In the following table the species are separated on coloration, without regard to the subgeneric divisions:

TABLE OF SPECIES OF CULEX BY COLORATION

1. Proboscis white-ringed in the female.....	2
Proboscis not completely white-ringed.....	4
2. White rings of the tarsi broad.....	3
These rings narrow; abdomen with dorsal segmental white patches or bands	<i>corniger</i> (var. <i>hassardii</i> Grabham) (2)
3. Femora and tibiæ with a fine white line on the outer side,	
	<i>tarsalis</i> (3)
These parts black on outer side.....	<i>stigmatosoma</i> (4)
4. Tarsi with white or pale rings at both ends of the joints.....	5
Tarsi unbanded.....	6
5. Large species; two distinct bare stripes on mesonotum.. <i>dyari</i> (19)	
Smaller species without extensive bare stripes on mesonotum; tarsal rings pale brown, indistinct, last joint of hind tarsi dark,	
	<i>restuans</i> (8)
6. Abdomen with apical segmental white bands, or at least lateral spots so situated.....	<i>saxatilis</i> (1)
Abdominal bands basal or absent.....	7
7. Basal joint of antenna greatly elongated; abdomen with no white markings	<i>cancer</i> (20)
Basal joint of antenna unmodified.....	8
8. Recumbent scales of occiput narrowly curved or lanceolate.....	9
These scales at least in part broad and subtruncate.....	18
9. Mesonotum red; abdomen with the bands indistinct,	
	<i>erythrothorax</i> (5)
Not so colored.....	10
10. Scales on the forks of second vein narrow, ligulate.....	11
These scales broad and ovate.....	<i>melanurus</i> (18)
11. Abdomen unbanded dorsally.....	12
Abdomen with basal segmental white bands.....	13
12. Lateral spots of the abdomen not visible dorsally.... <i>salinarius</i> (6)	
These spots visible dorsally.....	<i>palus</i> (7)
13. Band of second abdominal segment triangularly produced.....	14
This band transverse.....	16
14. Proboscis white marked beneath.....	<i>corniger</i> , var.
Proboscis not so marked.....	15

Section CULEX Linnaeus

2. **Culex (Culex) corniger** Theobald.

Culex corniger Howard, Dyar and Knab, l. c., iii, 240, 1915.

This species reaches us only in southern Florida. It is a well marked form, remarkably variable in coloration as adult, yet with distinct and easily recognizable characters in larva and male genitalia. The lobes of the side piece have three rods, the central one very stout, followed by a leaf-like appendage with a very delicate seta beside it and a seta beyond.

The species ranges over the Antilles, Mexico, Central America and South America to Brazil, having essentially a tropical distribution.

3. **Culex (Culex) tarsalis** Coquillett.

Culex tarsalis Howard, Dyar and Knab, l. c., iii, 230, 1915.

This species is common throughout the west, especially in the arid regions, and extends eastward as far as Illinois, disappearing in the forested country and at high altitudes. The larva has the air tube with five paired tufts, but the tufts are crowded together on the ventral line, confused and alternating, so that the normal position of the subapical tuft as out of line with the others is obscured. The larvæ may be found in all sorts of stagnant water in the open, permanent or semi-permanent, containing vegetation. The male genitalia have the lobe of the side piece with three rods, the marginal one shorter, a seta, a leaf-like appendage and another seta. The second plate of the unci is curved, one arm membranous and finely dentate on the inner side, the other arm tooth-like; on the surface between these two arms are 4 to 6 teeth, more or less irregular in size; from the base of the plate arises a single long horn, exceeding the central tooth in length.

4. **Culex (Culex) stigmatosoma** Dyar.

Culex stigmatosoma Howard, Dyar and Knab, l. c., iii, 236, 1915.

This species is confined to the Pacific coast region and has not been found east of the Sierras. The larva has the air-tube with five paired tufts, the subapical one moved out of

line. They frequent essentially temporary pools, of not too transient a nature, such as are left in stream beds where the rivers go dry in the summer or greatly diminish in volume. These pools are without vegetation. The genitalia are essentially as in *tarsalis*, the lobe of the side piece having three rods, a seta, a leaf-like appendage and a seta; the second plate of the unci is modified in the same manner, but there are only two teeth on the central portion.

5. **Culex (Culex) erythrothorax** Dyar.

Culex erythrothorax Howard, Dyar and Knab, l. c., iii, 315, 1915.

This species inhabits the southern part of California, south of the San Bernardino-San Gabriel-Coast Ranges, the northernmost record being Salinas. It has not been found in the San Joaquin or Sacramento Valleys. The larvæ live in sloughs of permanent water among cat-tails and *Lemna*, the water often of considerable depth and containing fish. The larva is much as in *pipiens* and *quinquefasciatus*, but has a longer air-tube and the subdorsal abdominal hairs are in threes. The development is slow. The male genitalia have the lobe of the side piece with three rods, subequal, a leaf-like appendage, straight on one side, a stout seta beside it and a seta beyond; the second plate of the unci has the lower arm tooth-like, the upper arm similar, not membranous; between these some 8 teeth in two ranks, subequal, and a long horn from the base, exceeding the teeth.

6. **Culex (Culex) salinarius** Coquillett.

Culex salinarius Howard, Dyar and Knab, l. c., iii, 373, 1915.

This ranges over the United States east of the Great Plains, except the southern part, being absent from Florida and unrecorded from the Gulf coast. It is commonest in open marshes, especially near the sea, though it does not inhabit salt marshes nor require even slightly saline water. The air-tube of the larva is long and slender, the body glabrous. The male genitalia have the lobe of the side piece with three rods, the marginal one a little shorter, but as stout as the others, a

leaf-like appendage, straight on one side, with a seta beside it and a seta beyond; second plate of the unci produced into two arms, neither membranous, the upper long and pointed, the lower bent at a rounded right angle; between these are some six teeth of various sizes; the long horn-shaped process from the base is flattened and seems to form the third plate rather than a tooth of the second.

7. *Culex (Culex) palus* Theobald.

Culex similis and *C. palus* Howard, Dyar and Knab, l. c., iii, 339, 342, 1915.

There seems no doubt that the names *similis* and *palus* refer to the same species. Edwards's opinion, quoted by us, may be definitely accepted.

This species inhabits the West Indies, covering also most of southern Florida. The larvæ inhabit the pools in coral rock, so abundant in the islands and generally any water of a permanent or semi-permanent nature. They are not found in artificial receptacles. The air tube is very long and slender, the skin of the body covered with little spiculæ. The genitalia have the lobe of the side piece with three rods, the marginal one smaller, a leaf-like appendage and a rod-like seta, no second seta between the rods and the leaf; the second plate of the unci has the outer arm membranous and curved, but small and without teeth, being finely pectinate outwardly; at the base of this piece the plate forms a rounded angle with a characteristic pectination; a long horn arises from the base; inner arm of plate horn-like, and three or four teeth on the margin between the arms, of different sizes.

8. *Culex (Culex) restuans* Theobald.

Culex restuans Howard, Dyar and Knab, l. c., iii, 333, 1915.

This species inhabits the United States east of the Great Plains, extending from Canada to Florida. The larvæ inhabit all sorts of collections of water, especially of a somewhat foul character, having been found in rain barrels and old tins. The larva is recognizable from *pipiens* and *quinquefasciatus* by the peculiar antennæ, which are uniformly shaped and without the "notch" generally characteristic of *Culex*. The male

genitalia have the lobe of the side piece with three rods, the marginal one shorter, a seta, a leaf-like appendage and another seta; the second plate of the unci is curved, the corners drawn out into stout teeth, the upper one long, the basal one short, one denticule between. When mounted undisturbed, the parts appear enclosed in an elliptical basket or cage, with a bent cross-bar, the sides bidentate.

Culex brehmei, described by Knab (Proc. Biol. Soc. Wash., xxix, 161, 1916), proves to be a fallacious species, the adults being *restuans*, the larvæ *pipiens*, a wrong association having been made by the collector, whose statement was accepted without the proof afforded by isolations.

The name *Culex territans* Walker appears to be the oldest name for this species, according to F. W. Edwards of the British Museum; but Walker's description does not fit this species and the name has long been applied to another species. We therefore drop the name as unrecognizable in order to avoid the confusion that would ensue by its further use.

9. *Culex* (*Culex*) *quinquefasciatus* Say.

Culex quinquefasciatus Howard, Dyar and Knab, l. c., iii, 345, 1915.

This species extends over the whole of the warmer portion of the earth, having become dispersed by commerce in former days. In the United States it occupies the southern Atlantic seaboard to the District of Columbia, where it is common, but does not extend much farther north. In the Mississippi Valley it probably extends farther. It is absent from the Great Plains and the whole of the west, except in the lower Colorado Valley, having been taken in the Imperial Valley, California, and Yuma, Arizona, as an extension of its range in Mexico, where it is abundant. The species is semi-domesticated in habit, the larvæ occurring in numbers in all artificial collections of water about human habitations, less common in the open country in natural pools, but so occurring occasionally. The larva is very close to that of *pipiens*, differing in the slightly shorter air-tube, with less numerous pecten teeth, and in the presence of single subdorsal hairs on abdom-

inal segments 3 and 4, these being double in *pipiens*. The male genitalia have the lobe of the side piece with three rods, of which the central one is slenderer, and not the marginal one shorter, followed by two fine setæ and a filamentous rod, a leaf-like appendage and a seta. Harpes with a crown of spines, the basal appendage short and straight; unci of four plates; 1, triangular and strongly pigmented; 2, curved, with a longer and a shorter arm as in *restuans*, but thin and not tooth-like; 3, long and flat, exceeding the other pieces and curving to one side; 4, upright and straight, the pair joined by a bridge.

10. *Culex* (*Culex*) *pipiens* Linnaeus.

Culex pipiens Howard, Dyar and Knab, l. c., iii, 360, 1915.

This species is a native of Europe, presumably introduced into the United States by commerce. It is spread over the northern part of the eastern region, from Virginia to New Hampshire, westward to Illinois. The larvæ are found in artificial collections of water and also in the open in pools that are sufficiently foul. The genitalia have the lobes of the side piece with three rods, the marginal one stoutest, two setæ and a filament, a leaf-like appendage and another seta; the unci have four plates; 1, triangular and pigmented; 2, concave, short and broad, the angles rounded and scarcely produced; 3, long and flat, exceeding the other parts but slenderer than in *quinquefasciatus* and often outbent angularly; 4, stout and long, somewhat tubular with a truncated tip, outbent with the other plates.

What has been known as *Culex comitatus* Dyar and Knab (Monog., iii, 369, 1915) inhabits the coastal area of California and lower Sacramento Valley (Roseville). The differences pointed out between it and *pipiens* are slight, and there seems little doubt but that it is actually *pipiens*, independently introduced into California by commerce during the last century. In describing *comitatus*, all our comparisons were made with *quinquefasciatus* and it never occurred to us to consider *pipiens* specially in this connection. If it had, we would have seen that a new name was unnecessary.

Section MELANOCONION Theobald

11. *Culex* (Melanoconion) *erraticus* Dyar and Knab.

Melanoconion atratus Dyar (not Theobald), Journ. N. Y. Ent. Soc., xiii, 26, 29, 1905.

Mochlostyrax erraticus Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 223, 224, 1906.

Melanoconion atratus Coquillett (in part, not Theobald), U. S. D. A., Bur. Ent., Tech. ser. 11, 24, 1906.

Mochlostyrax erraticus Dyar, U. S. D. A., Bur. Ent., Circl. 72, 3, 1906.

Culex abominator Dyar and Knab, Smith. Misc. Colls., quart. iss., lii, 257, 1909.

Culex abominator Howard, Dyar and Knab, Monog., iii, 378, 1915.

Culex erraticus Howard, Dyar and Knab, Monog., iii, 382, 1915.

This species inhabits the Mississippi Valley region—Illinois, Arkansas, Louisiana, and Texas. The larva has a straight, rather long air-tube, body and tube minutely pilose; lateral comb of the eighth segment in an irregularly double row. They live in permanent bodies of water full of aquatic vegetation. The genitalia have the side pieces greatly swollen, the lobes divided and highly modified; the clasp filament is distorted, furnished on the outer margin with fine hair and a nearly solid crest; terminal spine strong and curved like a hook.

12. *Culex* (Melanoconion) *peccator* Dyar and Knab.

Culex peccator Dyar and Knab, Smith. Misc. Colls., quart. iss., lii, 256, 1909.

Culex incriminator Dyar and Knab, Smith. Misc. Colls., quart. iss., lii, 257, 1909.

Culex peccator Thibault, Proc. Ent. Soc. Wash., xii, 20, 1910.

Culex peccator Howard, Dyar and Knab, l. c., iii, 318, 1915.

Culex incriminator Howard, Dyar and Knab, l. c., iii, 409, 1915.

The species has been recorded from Arkansas, Mississippi, South Carolina, Georgia, and Florida. The larvæ and life habits are unknown. The male genitalia are as in *erraticus* but the clasp filament has a weak terminal spine, the crest feathered, not solid.

13. *Culex* (*Melanoconion*) *anips* Dyar.

Culex anips Dyar, Ins. Ins. Mens., iv, 48, 1916.

Known only from southern California. The larvæ live in pools of permanent water with cat-tails and *Lemna*, containing fish; the larva has not been described. The male genitalia are as in *erraticus*, the clasp filament terminating in a weak spine as in *peccator*, the outer margin with two hair patches, not forming a crest.

Section MOCHLOSTYRAX Dyar and Knab

14. *Culex* (*Mochlostyrax*) *egberti* Dyar and Knab.

Culex egberti Howard, Dyar and Knab, l. c., iii, 421, 1915.

Known only from Lake Okeechobee, Florida, from female adults; male, larva and life history unknown. This may prove to be the same as *floridanus*; but, on account of the white spots on the abdomen, we keep it separate, pending further information.

15. *Culex* (*Mochlostyrax*) *floridanus* Dyar and Knab.

Mochlostyrax cubensis Dyar and Knab (not *Culex cubensis* Bigot), Journ. N. Y. Ent. Soc., xiv, 223, 225, 1906.

Mochlostyrax floridanus Dyar and Knab, Proc. Biol. Soc. Wash., xix, 171, 1906.

Culex agitator Dyar and Knab (new name), Journ. N. Y. Ent. Soc., xv, 100, 1907.

Culex deceptor Dyar and Knab, Smith. Misc. Colls., quart. iss., lii, 257, 1909.

Culex agitator Howard, Dyar and Knab, l. c., iii, 384, 1915.

Culex floridanus Howard, Dyar and Knab, l. c., iii, 402, 1915.

Culex deceptor Howard, Dyar and Knab, l. c., iii, 408, 1915.

Culex mastigia Howard, Dyar and Knab, l. c., iii, 426, 1915.

Inhabits southern Florida and Cuba. Our material is extremely scanty, consisting of the following: Of *floridanus*, larvæ, no adult; of *agitator*, larvæ, no adult; of *deceptor*, no larvæ, one male and one female adult (the third female type is *peccator*), the male mounted for genitalia and the abdominal markings cannot be distinguished; of *mastigia*, no larvæ, two male and two female adults, both males mounted for genitalia, but the bases of the abdomens remaining show broad white basal

bands. On this basis, we consider the above synonymy, while extremely probable, not absolutely assured.

The larva has a peculiar tapering air-tube with long tufts diminishing outwardly; lateral comb of the eighth segment of 8 spines in a curved row. It lives in permanent water with aquatic vegetation, and has the habit of hanging itself up on leaves, etc., by the hooks of the air-tube or lying on the bottom, seldom coming to the surface. The male genitalia have the basal appendages small and papillose.

16. *Culex (Mochlostyrax) peribleptus*, new species.

Female.—Proboscis black, very slightly swollen at the tip; head with flat black scales, mixed with white ones, especially along the margins of the eyes and on the sides; narrow curved golden ones posteriorly, which run forward in a triangular patch almost to the front margin in the center; many erect forked black scales. Integument of mesonotum blackish, rather sparsely clothed with small narrow curved scales, varying from dark brown to golden brown and light golden, the mesonotum appearing under a hand lens black, with illy defined golden double dorsal lines and short subdorsal ones posteriorly, with a somewhat curved patch in front of the short stripes. Abdomen black above, slightly violaceous, the bristles at the ends of the segments pale; lateral spots white, triangular; venter with the segments white at their bases, broadly black at the apices of the terminal segments. Legs black, the femora white beneath nearly to tips; tips of femora and tibiæ narrowly pale. Wing scales black, those on the forks of the second vein narrowly ovate, the outstanding ones linear.

Male.—The genitalia have the side pieces about three times as long as wide, excavated at the base; lobe divided, the basal portion again forked, one arm short, one long, each bearing a filament with minutely hooked tip; outer division produced, bearing a group of filaments at outer third, a leaf just before the tip and a small filament at tip; clasp narrowed centrally, swollen on outer third, with a terminal groove at the insertion of the small stout terminal spine, the outer margin finely pilose. Harpes narrowly comb-shaped; unci with the second

plate emarginate; basal appendages large, quadrately capitate.

Types, two males and two females, No. 21571, U. S. Nat. Mus.; Parr Shoals, South Carolina, August 1 and 18, 1915, bred from larvæ in a grass pond (T. H. D. Griffiths). No larvæ were sent.

17. **Culex (Mochlostyrax) pose**, new species.

Female.—Head with gray flat scales, shining white in a strong light, white on the margins of the eyes and the sides; narrow curved yellowish scales posteriorly, reaching the front margin at vertex; erect forked scales pale brownish. Integument of mesonotum blackish, rather sparsely clothed with narrow curved scales, varying from brown to light golden, under the lens showing paired blackish spots in front in a uniformly golden surface, the posterior third with four diffused golden lines on a dark ground. Abdomen black scaled, with basal segmental white bands, rather narrow and a little irregular, widening on the sides; the band on the second segment triangularly produced in the middle; venter whitish scaled, the last segments with weak blackish apical bands. Legs black, femora white beneath nearly to tips; tips of femora and tibiæ narrowly pale. Wing scales black, those on the forks of second vein narrowly ovate outwardly, many linear ones on basal part of fork.

Type, female, No. 21572, U. S. Nat. Mus.; Dallas, Texas, November 11, 1905 (W. E. Hinds).

Genus CLIMACURA Howard, Dyar and Knab

18. **Climacura melanurus** Coquillett.

Culex (Climacura) melanurus Howard, Dyar and Knab, l. c., iii, 453, 1915.

This species inhabits the eastern United States. It is peculiar in passing the winter in the larval stage in the small water holes in boggy land where it lives. The eggs are laid singly. The species is rare, though widely distributed in swampy regions.

Genus CULICELLA Felt

19. *Culicella dyari* Coquillett.

Culex (Culicella) dyari Howard, Dyar and Knab, l. c., iii, 457, 1915.

It occurs in the northeastern States, westward to the mountains of British Columbia. The larvæ are found in the early spring in the pools left from the melting of the snow. All our records for the adults are in May. It appears there is but a single annual generation and the winter must be passed in the egg state. This species is not a *Culex* on habits any more than by the structure of the male genitalia.

Genus DEINOCERITES Theobald

20. *Deinocerites cancer* Theobald.

Deinocerites cancer Howard, Dyar and Knab, l. c., iii, 201, 1915.

This species has been taken in southern Florida. The larvæ live in the water in the holes of certain species of crabs along the tropical seashore. While this forms not more than a section of *Culex* by the male genitalia, the characters of the larvæ and adults have differentiated to such an extent that it is best classed as a genus.

A SECOND NOTE ON THE SPECIES OF CULEX OF THE BAHAMAS

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

The present author, jointly with Mr. Frederick Knab, published a note on the species of *Culex* of the Bahamas, based upon collections made in 1915. In Shattuck's "The Bahama Islands," published by the Geographical Society of Baltimore. Dr. T. H. Coffin lists the mosquitoes collected by himself in 1903. His names are as follows, together with the corrected nomenclature supplied in Howard, Dyar and Knab's Monograph, "Mosquitoes of North and Central America and the West Indies," 1912-17.

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The following species have been since recorded:

Aedes albonotata Coq. Monogr., p. 855. New Providence Is., 1915 (Dyar).

Culex bahamensis D. & K., Journ. N. Y. Ent. Soc., xiv, 206, 210, 1906.

Culex similis Theob., Monogr., p. 342, New Providence Is., 1915 (Dyar); Dyar and Knab, Ins. Insc. Mens., iii, 112, 1915.

Culex aseyehae Dyar and Knab, Ins. Insc. Mens., iii, 112, 1915.

Culex sp., Dyar and Knab, Ins. Insc. Mens., iii, 115, 1915.

It will be noticed that the species recorded by Coffin as *Culex restuans* was not restudied for the Monograph. I have recently gone over this and find that a new and very interesting form is represented.

Culex (Transculicia, new subgenus) eleuthera, new species.

Female.—Head with sparse narrow curved bronzy brown scales and numerous erect forked black ones; the sides with flat white scales, which run a little way up along the margin of the eye. Proboscis black, the middle portion injured. Mesonotum brown, with three darker lines in the integument, sparsely clothed with narrow curved bronzy brown scales, mixed with a few silvery whitish ones, which appear prin-

cipally in a pair of small round subdorsal dots. Abdomen black-scaled, with basal segmental white bands, widening a little in the middle and hardly widening at all at the sides; venter pale scaled. Wing scales dark, the costa, first and third veins closely scaled and appearing darker than the others. Legs black-scaled, femora and tibiæ whitish-lined below; tarsi narrowly but distinctly white-ringed at bases and apices of the joints, especially at the apices, the tibiæ also white at base and apex narrowly. Claws simple.

Male.—Proboscis with a pale spot beyond the middle, labellæ pale. Palpi exceeding the proboscis, black; broad white rings at the bases of the joints and the middle of the long joint; last two joints bristly. Antennæ normal, plumose. Mesonotum with more silvery scales than in the female, especially posteriorly about the antescutellar space. Venter of abdomen with a blackish band at the base of the penultimate segment. Claws one-toothed.

Genitalia.—Side pieces about twice as long as wide, strongly excavated at base; a quadrate hairless lobe arising from the apex of the basal emargination, bearing two short, stout, thickened appendages and a smaller one just below. Setæ of side pieces short, evenly distributed without, gathered in little patches within, one group on each side of the lobe, one at the outer third of the side piece and a larger patch just before tip. Clasp filament long, slender, uniform, with minute terminal spine. Harpes with a long basal branch, the tips rather delicate, curving over ventrally and densely covered with fine spines. Unci divided into three plates, the first slender, straight, upright, pointed at tip; second rounded, capitate, laminate, the profile of the laminæ spinous, heavily pigmented; third short, angularly bent and projecting outward at right angles. No basal appendages; no scales.

Types, one female, three males, No. 21570, U. S. Nat. Mus.; Governor's Harbor, Eleuthera, Bahamas, July 6, 1903 (T. H. Coffin).

The new subgenus is based on the peculiar male genitalia. The lobes of the side pieces are quite unlike those of any *Culex* proper and are closely similar to *Dëinocerites*. The harpes,

however, are tufted as in *Culex* proper and not comb-shaped as in *Deinocerites*. The unci are as in neither of these groups.

Culex bahamensis was described from larvæ collected by Dr. Coffin, the adults being unknown. I have considered the possibility of the present species being the adult of *bahamensis*, but do not think it to be probable. The larva of *bahamensis* has the tufts of the air-tube in a straight line and therefore should belong in the *Melanoconion* group of *Culex*; *eleuthera* has the harpes tufted and belongs in *Culex* proper. The locality where Coffin took the *bahamensis* larvæ is not now known, but they were evidently not taken at Governor's Harbor, Eleuthera, for Dr. Coffin, in his published account, does not mention having taken larvæ at that place.

***Culex aseyehæ* Dyar and Knab.**

Diligent search has failed to locate the types of this species. I can only conclude that Mr. Knab failed to attach type labels at the time of description, but left the specimens standing in the box, and they have now been placed with *quinquefasciatus* by me. I think the name is a synonym of this species. At the time, I was under the impression that the short-tubed larva breeding in "wild" rock-holes with *similis* and *sphinx* was a new species, and I told Mr. Knab so, persuading him, after my departure from Washington, and no doubt against his better judgment, to draw up a description. Recent study of the material shows that this species is only *quinquefasciatus*, breeding in "wild" pools. In fact this species seems to be distinctly less domesticated than *pipiens*, at least in regard to breeding places, for *aseychæ* was bred from a surface rock-pool on the road to Lake Cunningham with no habitation whatever within sight.

***Culex reductor* Dyar and Knab.**

The species listed by Mr. Knab and myself as *Culex* sp. may be safely identified with *Culex reductor* of Jamaica. The larva agrees exactly with that species, and not with *floridanus* of Florida and Cuba.

This peculiar distribution is paralleled by *Aedes albonotata*, a Santo Domingan species which I took in Nassau, but which

is not known from Cuba. Can the West Indian hurricanes have anything to do with this distribution? In an ordinary storm, mosquitoes seek shelter and do not rise; but a hurricane may conceivably carry them away, shelter and all. Now, the general track of these hurricanes, as shown by Dr. Fassig, is in a curved line convex to the Florida peninsula. The storms passing over Santo Domingo commonly pass next over the Bahamas, while those passing over Cuba generally strike southern Florida. I do not know whether mosquitoes are ever actually transported by these storms. While the wind is very violent, the rate of progress of the storm is comparatively slow, 10 to 12 miles an hour, according to Fassig. Moreover, we know too little about the actual distribution of the species. Collecting in the West Indies has been of the most fragmentary sort.

THE LARVA OF *Aedes idahoensis*

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

In *Insecutor Inscitiæ Menstruus* (v. 120, 1917) I described an unknown *Aedes* larva from Montana. Recently Prof. J. R. Parker sent me seven bred adults with larval skins, the larvæ found in a roadside pool, June 28, 1916. The adults are five females and two males. Three females are *idahoensis* with basal white abdominal bands; one female has in addition scattering white scales down the middle of the abdomen, rather distinct at the tips of the segments, and the remaining female has a broad suffused dorsal stripe, predominant posteriorly. The larvæ are all alike, having the following characters:

Head hairs single; skin conspicuously spicular-pilose; comb of the eighth segment with 14 scales, each with central thorn about as long as the body of the scale; air-tube short, the pecten of 19–21 teeth, the last two or three detached, followed by the hair-tuft; anal segment not ringed by the plate, the hairs running basally along the ventral line.

This, then, is the larva of *idahoensis*. The larva described by me as above noted differs slightly. It has fewer teeth on the air-tube and more scales in the lateral comb of the eighth segment; but the skin is spicular-pilose as in *idahoensis*. These differences may possibly be varietal, and, if so, then I have described the larva of *idahoensis*. But the matter will have to be looked into further.

As to the larva of *spencerii*, it differs rather distinctly. The skin is glabrous, or with but traces of spicules; the comb of the eighth segment has but eight teeth, each with long terminal spine, longer than the body of the scale; pecten of the air-tube with 12 teeth, reaching to the middle of the tube only.

It would appear that *spencerii* and *idahoensis* represent distinct species and that *spencerii* is absent from southern Montana, the *spencerii*-like forms taken there being aberrations of *idahoensis*. This is the conclusion to which I was inclined while collecting in Montana (see *Ins. Ins. Mens.*, v, 119, 1917), except that I thought the larvæ of the two forms would turn out to be alike, which is now shown not to be the case.

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Date of publication, January 29, 1918.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar and
Frederick Knab.

Subscriptions and matter for publication should be addressed to Harrison
G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the
manuscript.

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INSECUTOR INSCITIAE MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. VI

JANUARY-MARCH, 1918

Nos. 1-3

247426

Insecutor Inscitiae Menstruus

Vol. VI.

JANUARY-MARCH, 1918

Nos. 1-3

ON A COLLECTION OF ORTHOPTERA (EXCLUSIVE OF THE LOCUSTIDÆ) MADE IN CENTRAL PERU BY N. ICONNICOFF AND C. SCHUNKE

By A. N. CAUDELL

The material upon which this report is based was submitted to the writer for determination under an agreement by which holotypes, allotypes, and uniques in the Tettigonidæ and Mantidæ and a male and a female of each species in duplicate in the other families represented are deposited in the collection of the United States National Museum, all the rest of the material to be returned to Mr. Iconnicoff.

The Dermaptera, as represented in this material, consists of a single specimen. If others were taken and sent elsewhere for determination, or if the single specimen herein included constitutes the whole of this group represented in the collection, is not known to the writer. The first surmise, however, seems the more likely.

The Blattidæ of this collection were reported on by the late Mr. Shelford.¹ A few of these roaches, for some reason not submitted to Mr. Shelford, were sent with the other material here reported on, and will be found included at the proper place.

The Mantidæ and Phasmidæ are moderately represented and the Gryllidæ somewhat better so, but the Tettigonidæ, especially the Pseudophyllinæ and the phaneropterous genus *Anaulacomera*, form the most interesting portion of the collection.

¹ Rev. Russ. d'Ent., vol. xii, pp. 27-34, figs. 1-5 (1912).

Many apparently new forms are represented in this material, as was also the case in the Blattidæ, as shown by Shelford's report on that group. A number of described forms are species not before reported from Peru, being extensions from the north and east up the valleys of the Amazon and its tributaries.

The proportion of new species recognized in the present collection is approximately the same as that in the collection made by the Yale Peruvian Expedition of 1911,¹ but not a single form described as new from these two collections is represented from both localities. This, however, probably signifies but little, as these localities are some 200 miles apart and may comprise very different regions. It may prove that many sections of this interesting portion of Peru, owing to their separation by mountain ranges, etc., have each its quota of undescribed forms, some incipient and others well differentiated from allied species. But many years will probably pass before much information regarding such matters will be acquired. At present we can truthfully say of the Orthoptera as a whole what Shelford states of the Blattidæ—we are still singularly ignorant of the Peruvian fauna.

Specific locality labels are not attached to the specimens herein reported on, each bearing only the locality by longitude and latitude, this in every case being 75° 17' W. of Greenwich, 11° 3' S. lat. This locality, being common to every specimen in the collection, is not repeated in the following pages, but in every case the date, usually the month and year, rarely the day also, but often only the year, is given. The name of the collector is also always stated. In the case of species described as new the disposition of the specimens is specifically stated. Paratypic material is recorded by letters a, b, c, etc., in order to facilitate reference to particular paratypes when necessary.

The sequence of arrangement is according to that of Kirby's Synonymic Catalogue of Orthoptera and the references quoted are usually confined to that work and to the place of original description.

¹ Proc. U. S. Nat. Mus., vol. xliv, pp. 347-357 (1913).

Order DERMAPTERA

The single specimen of this group turned over to me for determination proved to be as follows:

Pyragra dohrni Scudder.

Thermastris dohrni Scudder, Proc. Bost. Soc. Nat. Hist., vol. xvii, p. 280 (1875); *Pyragra dohrni* Kirby, Syn. Cat. Orth., vol. i, p. 7 (1904).

Pygidicrana peruviana Rehn, Proc. U. S. Nat. Mus., vol. xxix, p. 501, Fig. 1 (1905); Burr, Proc. U. S. Nat. Mus., vol. xxxviii, p. 445 (1910).

One ♀, November, 1908. Schunke.

This specimen, which is not in good condition, the antennæ and most of the legs being missing, was compared with Scudder's type of *dohrni* and found to agree. It also agrees perfectly with the type of *Pygidicrana peruviana* Rehn in the National Museum. This specimen is returned to Mr. Iconnicoff.

Order ORTHOPTERA

Family BLATTIDÆ

Nyctibora brunnea Thunberg.

Blatta brunnea Thunberg, Mem. Acad. Sci. St. Petersburg, vol. x, p. 278 (1826); *Nyctibora brunnea* Shelford, Trans. Ent. Soc. Lond., p. 467 (1908); Wytsman's Genera Insectorum, Fasc. 74, p. 2 (1908).

Nyctibora holosericea Burmeister, Handb. Ent., vol. ii, p. 502 (1838); Kirby, Syn. Cat. Orth., vol. i, p. 107 (1904); Shelford, Wytsman's Genera Insectorum, Fasc. 74, p. 2 (1908).

Nyctibora obscura Saussure, Rev. Zool., (2), vol. xvi, p. 316 (1864); Kirby, Syn. Cat. Orth., vol. i, p. 2 (1904).

One ♂, November, 1908; one ♀, April, 1909. Schunke.

This species, as identified by the writer, is very close to *mexicana* Saussure, the principal difference appearing to be the color of the femora, which in these Peruvian specimens here referred to *brunnea* are yellowish or reddish brown, while all specimens of *mexicana* seen have had the femora piceous.

Thunberg's name *brunnea* was not listed in Kirby's catalogue.

Paratropes æquatorialis Saussure.

Paratropes æquatorialis Saussure, Rev. Zool., (2), vol. xvi, p. 309 (1864); Kirby, Syn. Cat. Orth., vol. i, p. 109 (1904).

One ♂, one ♀, October 11, 1908; two ♂ ♂, November, 1908; three ♀ ♀, January, 1909. Schunke.

This species, as here determined, superficially resembles *P. mexicana* Brunner but the abdomen is almost entirely black beneath while in *mexicana* it is distinctly bordered with yellowish. The inner margin of the apical infuscation of the wings of *æquatorialis* is nearly straight (Pl. I, fig. 1), the infuscation nearly or quite covering the whole apical half of the ulnar area. In *mexicana* this infuscation covers only the apical fifth or sixth of the ulnar area and the inner margin of this darkened area is considerably curved (Pl. I, fig. 2).

Paratropes pica Walker.

Paratropes pica Walker, Cat. Blatt. Brit. Mus., p. 151 (1868); Kirby, Syn. Cat. Orth., vol. i, p. 110 (1904).

One ♀, October, 1908. Schunke.

This specimen agrees exactly with the original description and with the colored figure given by Mr. Shelford in Wytsman's Genera Insectorum, Fasc. 74, plate i, fig. 10 (1908).

Epilampra conspersa Burmeister.

Epilampra conspersa Burmeister, Handb. Ent., vol. ii, p. 505 (1838); Kirby, Syn. Cat. Orth., vol. i, p. 126 (1904).

One ♂, October, 1908. Schunke.

Panchlora peruana Saussure.

Panchlora peruana Saussure, Rev. Zool., (2), vol. xvi, p. 342 (1864); Kirby, Syn. Cat. Orth., vol. i, p. 153 (1904).

Three ♀ ♀, September and November, 1908, and April, 1909.

Panchlora moxa Saussure.

Panchlora moxa Saussure, Rev. Zool., (2), vol. xiv, p. 231 (1862); Kirby, Syn. Cat. Orth., vol. i, p. 153 (1904).

Two ♀♀, December, 1908, and January, 1909. Schunke.

Family MANTIDÆ

Choeradodis laticollis Serville.

Choeradodis laticollis Serville, Ann. Sci. Nat., vol. xxii, p. 51 (1831); Kirby, Syn. Cat. Orth., vol. i, p. 220 (1904).

One ♀, September 20, 1906. Iconnicoff.

Acontista westwoodi Saussure and Zehntner.

Acontista westwoodi Saussure and Zehntner, Biol. Cent.-Amer., Orth., vol. i, p. 134 (1894); Kirby, Syn. Cat. Orth., vol. i, p. 233 (1904).

One ♀, November, 1908. Schunke.

Liturgousa lichenalis Gerstaecker.

Liturgousa lichenalis Gerstaecker, Mitth. Ver. Vorpomm., vol. xx, p. 52 (1889); Kirby, Syn. Cat. Orth., vol. i, p. 271 (1904).

One ♀, October, 1908. Schunke.

Macromantis ? sp.

One immature ♀, August 10, 1906. Iconnicoff.

No more than a questionable generic determination can be safely made of this nymph.

Pseudomiopteryx bogotensis Saussure.

Pseudomiopteryx bogotensis Saussure, Mitth. Schweiz. Ent. Ges., vol. iii, p. 228 (1870); Kirby, Syn. Cat. Orth., vol. i, p. 275 (1904).

One ♂, November, 1908. Schunke.

Acanthops erosula Stal.

Acanthops erosula Stal, Bihang Svenska Akad., vol. iv, (10), p. 90 (1877); Kirby, Syn. Cat. Orth., vol. i, p. 283 (1904).

One ♀, August, 1908. Schunke.

This species was originally described from Peru but no mention is made of that locality in Kirby's catalogue.

Oxyopsis acutipennis Stal.

Oxyops acutipennis Stal, Bihang Svenska Akad., vol. iv, (10), p. 71 (1877); Kirby, Syn. Cat. Orth., vol. i, p. 298 (1904).

Oxyopsis actuiipennis Giglio-Tos, Boll. Mus. Torino, vol. xxix, No. 684, p. 15 (1914).

One immature ♀, January, 1909. Schunke.

This specimen is apparently in the last instar.

Stagmatoptera ? sp.

One small nymph with the end of the abdomen missing. March 9, 1906. Iconnicoff.

Family PHASMIDÆ

Libethra rollei Brunner.

Libethra rollei Brunner, Die Ins. Fam. der Phasmiden, p. 306 (1907).

Four ♂♂, October 11, November 8 and 21, 1906. Iconnicoff.

These specimens have the second segment of the abdomen nearly or quite three times as long as broad, indicating a relationship with the genus *Dyme* rather than *Libethra*. But they agree with the description of *L. rollei* and Brunner includes it in his key to the species of *Dyme* as well as that of *Libethra*, showing that he also recognized its relationship to both these genera.

There is some variation in the measurements of these four specimens, the fore femora varying from 16 to 19 mm. in length.

Libethra peruana, new species.

This is a moderately stout form of a brown or blackish color which runs out in the key to species in Brunner's monograph¹ to *L. rugosa* Brunner, but it possesses several characters separating it from that species as described by Brunner, the most obvious one being the ventrally lobed femora. Nor does the description of *rugosa* mention the prominent dorsal flange in the posterior margin of the sec-

¹ Die Ins. Fam. der Phasmiden, p. 305 (1907).

ond abdominal segment so noticeable in this species here described.

Description (♀, the ♂ unknown).—Head slightly flattened above and densely covered with acute tubercles, usually with two groups, each comprising one larger tubercle with some smaller ones, between the eyes standing forth a little more prominent than the others. Eyes small, moderately prominent; ocelli not evident. Thorax indistinctly carinate, rugose and tuberculate, the pronotum furnished above on the posterior margin with a pair of blunt spines or acute tubercles, distinctly longer and more conspicuous than the others. Abdomen subcylindrical; median segment distinct, transverse; third, fourth, fifth, and sixth abdominal segments multicarinate, the carinæ distinct but low and nearly straight; second segment with a somewhat conspicuous expansion on the posterior margin above; first, third, and fourth segments with a small V-shaped expansion at the same location; seventh and eighth segments furnished above on the posterior margin with a pair of longitudinally disposed swellings, the pair on the seventh segment the larger; operculum failing to reach the tip of the abdomen and angularly emarginate apically. Legs stout, the fore femora conspicuously curved basally and a little longer than the mesonotum; all the femora and tibiæ are more or less foliate above and the femora of the middle legs especially have a couple of very noticeable expansions on the ventral margins, these expansions extending out laterally from the femora, those on the cephalic margin being the larger; the posterior and intermediate tibiæ have one or two small foliations beneath. Cerci short, less than twice as long as broad, scarcely surpassing the last abdominal segment.

Measurements.—Length, total, 55 mm., mesonotum, 13.5 mm., fore femora, 15 mm., hind femora, 15 mm.; width, mesothorax at middle, 4 mm., median segment, 5 mm.

Described from four ♀♀. Type and paratype a, December 4, 1906. Iconnicoff. Paratypes b and c, August and September, 1908. Schunke.

Type and paratype b in Iconnicoff collection; paratypes a and c in collection of the United States National Museum.

Cat. No. 21321, U. S. Nat. Mus.

Sermyle sp.

Two ♀ nymphs, one without date and one taken December 12, 1906. Both by Iconnicoff.

These specimens are not in good condition and this, together with their immaturity, makes an attempt at a specific determination inadvisable. The legs are lobate and the thorax and abdomen are furnished with lateral expansions. The head is armed on the occiput with a pair of flattened hornlike projections.

The type of *Sermyle* by designation of both Rehn, Proc. Acad. Nat. Sci. Phila., p. 51 (1904), and Kirby, Syn. Cat. Orth., vol. i, p. 345 (1904), is the *Ceroys mexicanus* of Sausure. Brunner, Die Ins. Fam. der Phasmen, p. 315 (1907), places this species in his new genus *Ocnophila* and, on page 333 of the same work, indicates without comment that Stal, the author of *Sermyle*, misidentified this species, and he described what he considers Stal really has as a new species, *praetermissus*. But it is unimportant whether Stal made a misidentification or not as *mexicanus*, having been properly designated as the type of *Sermyle*, is the type according to the rules of the Entomological Code and by the recent decision of the International Commission of Zoological Nomenclature to the effect that the misidentification of a species by the describer of a genus does not affect the eligibility of that species as a genotype. Thus the genus *Ocnophila* Brunner is a synonym of *Sermyle* Stal unless it proves to be composite, in which case the name can be used for those species not congeneric with *mexicanus*. And it seems very likely that there are two generic groups comprised in the species treated under this generic name by Brunner. This is indicated by the fact that many forms included here have the metatarsus of the anterior tarsi as long as the rest of the segments together while others have this segment but one-half the combined lengths of the others.

The species with long metatarsus would run out to Brunner's genus *Parapygirhynchus* if the anal segment of the female is produced. But if this segment is truncate it would constitute a separating character for the genus *Ocnophila* except that it is a secondary sexual character and such characters are usually deemed undesirable for generic differentiation. Without more material in the forms concerned the task of separating *Ocnophila* from *Scrmyle*, or the responsibility of sinking the former in synonymy, must be left for some future consideration.

Bacteria virgulata Redtenbacher.

Bacteria virgulata Redtenbacher, Die Ins. Fam. der Phasmiden, p. 420 (1908).

One ♂, December 9, 1906. Iconnicoff.

Pseudophasma urazi Bolivar.

Phasma urazi Bolivar, Actas Soc. Espan., vol. xxv, p. 13 (1896).

Pseudophasma urazi Kirby, Syn. Cat. Orth., vol. i, p. 412 (1904).

One ♀ and one nymph, November 10 and December 11, 1906. Iconnicoff. Two nymphs, November, 1908, one ♂, January, 1909, and one ♂ and one ♀, without date. Schunke.

Dyme mamillata Brunner.

Dyme mamillata Brunner, Die Ins. Fam. der Phasmiden, p. 323 (1907).

One ♂, November 10, 1906. Iconnicoff.

This specimen agrees very nicely with Brunner's description and runs out properly in his keys.

Dyme nigrolineata Brunner.

Dyme nigrolineata Brunner, Die Ins. Fam. der Phasmiden, p. 325 (1907).

One ♂, November 24, 1906, and two nymphs, November 8 and 29, 1906. Iconnicoff.

These specimens run out to this species in Brunner's keys and agree with the short diagnosis except the antennæ show no distinct annulation, though it is basally somewhat darker, especially above. While the type locality, Surinam, is a long

distance from where these specimens were taken, I can not, nevertheless, from the data available, consider them other than this form.

There are also four ♀ specimens in the collection which are referred here with some doubt. Three were taken by Iconnicoff, November 7 and 18 and December 10, 1906, and one by Schunke, November, 1908. They vary in color from dark brown to greenish and the abdominal segments are multicarinate above. The cerci are short and stout, projecting but little beyond the end of the abdomen. The operculum fails to reach the end of the body and is apically entire with a small median triangular tooth. The second segment of the abdomen is distinctly longer than broad but scarcely twice as long. Measurements of the most perfect specimen are: Length, total, 43 mm.; mesonotum, 11 mm.; fore femora, 13 mm.

Dyme iconnicoffi, new species. (Pl. I, fig. 3.)

This apparently undescribed form seems to be the most nearly allied to *Dyme ingenua* Brunner from Brazil but is smaller and the posterior femora attains to the tip of the sixth abdominal segment.

Description (♂, the ♀ unknown).—General color entirely dark brown, the antennæ and the fore tibia, especially in apical portion, tending toward reddish or yellowish brown. Entire body, head, thorax, and abdomen somewhat densely covered with small tubercles with a few larger yellowish brown blister-like swellings on the mesonotum and metathorax. Head somewhat longer than the greatest width, much broader in front than behind and very little flattened above; eyes round and prominent; ocelli not evident except as represented by lighter spots; antennæ long, the first two segments enlarged, the first somewhat flattened as usual. Pronotum dorsally flattened, the disk about twice as long as broad with crossed sulci in the middle; meso- and metanotum cylindrical, enlarged at the ends, the former considerably longer than the latter; median segment distinct, scarcely longer than broad. Abdomen almost parallel sided

to the apical three segments which are moderately expanded, especially the seventh and eighth; the terminal segment is apically notched, about as broad as long, rounded above with a distinct straight median carina and a very obscure roundly divergent ridge on each side; supraanal plate concealed, as are also the cerci, which are stout, subcylindrical, apically swollen, incurved organs, apically rounded and covered with short hairs; operculum¹ prominent, short. Legs slender; all the tibiæ and the posterior and intermediate femora with one to three or four small expansions above; tibiæ without apical arolia beneath; tarsi moderately slender, the metatarsi distinctly shorter than the rest together except that of the hind leg where it is about as long; femora unarmed beneath, the anterior ones a little curved basally and somewhat longer than the mesonotum; posterior femora reaching to the tip of the sixth abdominal segment.

Measurements.—Length: Total, 55 mm.; mesonotum, 14 mm.; metanotum, 8.5 mm.; median segment, 1.5 mm.; anterior femora, 17 mm.; middle femora, 12 mm.; hind femora, 16 mm.; anterior tibiæ, 20 mm.; middle tibiæ, 15 mm.; posterior tibiæ, 21 mm.

Described from one ♂, December 12, 1906. Iconnicoff.

Type in collection of Iconnicoff.

Acanthoclonia flavicornis, new species. (Pl. I, figs. 6,7.)

This form is allied to *A. immanis* Scudder, with the type of which it has been compared, but it is clearly distinct from that species. The yellow antennæ are apparently distinctive, such coloration not being mentioned in the descriptions of allied species.

Description (♂, the ♀ unknown).—Head elongate, diagonally attached and the surface deeply rugose and tuberculate, the occiput armed with a pair of divergently erect lamellate expansions which are twice as long as broad and armed apically and along the margins with stout erect spines;

¹ Though not exactly homologous, the ventral modification near the end of the abdomen of both sexes is designated by this term.

just posterior of this pair of expansions is a pair of very large stout spines with serrated edges, and in front, between the antennæ, are two groups of a few more elongate tubercles, the longest almost a blunt spine; antennæ with the basal two segments considerably enlarged, the basal one with a large double pointed tubercle on the upper apical margin; eyes slightly oval and very prominent, projecting more than half their depth beyond the surface of the head. Pronotum quadrate, armed above with a pair of very large acute triangular processes, or spines, and other smaller spinelike tubercles and rugosities; mesonotum armed laterally with several long stout simple spines and above with two pairs of acutely pointed elongate triangular plates or broad based spines with serrated edges; metanotum armed above near the cephalic margin with a pair of very large double pointed, thick based spines and on each side over the posterior coxæ with a flat flange terminated in three stout spines; median segment about two-thirds as long as the metanotum and moderately distinct, armed above near the cephalic margin with a single stout median spine. Abdomen triangular in cross section except the sixth and seventh segments which are flattened above; the seventh and eighth segments are much broadened and the ninth is small, narrow, and turned up to a nearly vertical position, its narrowness due to lateral folding; the whole abdomen is covered with small tubercles and the basal three segments are each armed with a pair of large simple dorsolaterally located spines; operculum broad, compressed ventrally and reaching the tip of the abdomen, the surface rough. Legs moderately stout; femora and tibiæ all unarmed mesially beneath, but the femora are armed laterally with a few short blunt ventral spines on both sides; above the femora and tibiæ are armed with very broad based spines, those on the tibiæ small, but mere lamellations, being without pointed apices, but two or three in number and in a single row, but those of the femora are larger, acutely pointed and in two rows of two to four pairs; anterior femora scarcely at all curved basally; metatarsi about half as long as the combined

lengths of the rest of the tarsal segments. General color black-brown, almost black, except the antennæ beyond the second segment, which is yellow with the extreme tip of the segments very narrowly darkened; a rounded slightly elevated median dorsal ridge extending from the front margin of the mesonotum to near the end of the abdomen is yellowish brown and the legs are very slightly lighter than the rest of the general color.

Measurements.—Length: Total, 42 mm.; fore femora, 12 mm.; middle femora, 10 mm.; hind femora, 13 mm.; mesonotum, 6.25 mm.; width: across metanotum, 4 mm.

Described from a single ♂, December 6, 1906. Iconnicoff.

Type in collection of Iconnicoff.

Family TETTIGONIDÆ

Subfamily GRYLLACRINÆ

Hyperbaenus virgo Brunner.

Hyperbaenus virgo Brunner, Verh. zool.-bot. Ges. Wien, vol. xxxviii, p. 368 (1888); Kirby, Syn. Cat. Orth., vol. ii, p. 148 (1906).

One ♀, May, 1909. Schunke.

Hyperbaenus juvenis Brunner.

Hyperbaenus juvenis Brunner, Verh. zool.-bot. Ges. Wien, vol. xxxviii, p. 368 (1888); Kirby, Syn. Cat. Orth., vol. ii, p. 148 (1906).

One ♀, September, 1908. Schunke.

This is the variety mentioned by Griffini in his monographic study of this genus, Redia, vol. vii, p. 187-203 (1911).

Hyperbaenus brevipennis, new species. (Pl. I, fig. 8.)

This species is referred to this genus by the absence of subgenital styles and other generic characteristics pertaining to *Hyperbaenus* and is clearly differentiated from all other members of the genus by the brevity of the organs of flight.

Description (♂).—Head of approximately the same

width as the pronotum; fastigium of the vertex smooth, rounded, and twice as broad as the basal segment of the antenna. Pronotum smooth, a little longer than broad, anteriorly and posteriorly broadly rounded; lateral lobes elongate, the humeral sinus shallow but distinct. Abdomen short, the last dorsal segment bent abruptly downward and inward behind a bifurcated erect organ which may be the supraanal plate or a genital organ (see Pl. I, fig. 8); subgenital plate sulcate ventrally, apically bituberculate but without styles; cerci simple, cylindrical, curved upward and inward, somewhat longer than indicated by the figure. Legs stout; fore and middle tibiæ with four large hairy calcars and a very small apical one on each ventral margin, unarmed above; hind tibiæ unarmed beneath except for two short chitinous tipped calcars on each side but above is armed on both margins with five or six stout fixed spines in addition to the apical calcars; fore and middle femora unarmed above and below, the posterior ones armed beneath on the inner margin with two or three distinct but small spines, the apical one larger, often a still smaller one farther toward the base, and on the outer margin with six moderate spines, all spines black tipped. Tegmina apically broadly rounded and about three times as long as broad when spread, when folded they are somewhat rolled and then appear narrower and more pointed; they barely surpass the tip of the abdomen, extending but a little beyond the middle of the posterior femora; wings hyaline, just barely exceeding the tegmina when closed, not at all when spread; the veins opaque.

General color uniformly yellowish; eyes blackish; spines of legs reddish brown for nearly the entire length, apically darker.

(♀).—Similar to the male, the spines of the hind femora a little larger; vertex blackish with conspicuous yellowish ocellar spots. The cerci are short and nearly straight and the ovipositor is much longer than the posterior femora, apically bluntly rounded and the whole curved uniformly upward.

Measurements.—Length: Pronotum, ♂, 3.5 mm.; ♀, 4.5 mm.; hind femora, ♂, 10 mm.; ♀, 10 mm.; tegmina, ♂, 12 mm., ♀, 12 mm.; ovipositor, 14 mm.; width: tegmina at widest point, ♂, 3.75 mm.; ♀, 4 mm.

Described from one ♂ and one ♀. Type ♂, December 1, 1906. Iconnicoff. Allotype ♀, November 12, 1906. Iconnicoff.

Type and allotype in the collection of the U. S. National Museum.

Cat. No. 21322, U. S. Nat. Mus.

Subfamily COPIPHORINÆ

Moncheca bisulca Serville.

Locusta bisulca Serville, Encycl. Method. Ins., vol. x, p. 342 (1825); *Exocephala bisulca* Kirby, Syn. Cat. Orth., vol. ii, p. 233 (1906); *Moncheca bisulca* Karny, Wytsman's Gen. Insectorum, Fasc. 139, p. 16, pl. iii, fig. 2 (1912).

Three ♀ ♀, October and November, 1908, and March, 1909. Schunke.

These specimens are similar to a female before me from Venezuela except the size is a little less and the pronotum is uniformly yellowish while in the Venezuela specimen the pronotum is marked by a broad irregular transverse stripe extending across both disk and lateral lobes, covering most of the latter, and the disk margined before and behind with blackish, narrower in front, and there extending downward well onto the lateral lobes. The smaller size of the Peruvian specimens together with the uniformly colored thorax may indicate a new species but it does not seem well to characterize them as such at this time.

Neoconocephalus subulatus Bolivar.

Conocephalus subulatus Bolivar, Ann. Soc. Espan., vol. x, p. 498 (1881); *Conocephaloides subulatus* Kirby, Syn. Cat. Orth., vol. ii, p. 241 (1906); *Neoconocephalus subulatus* Karny, Wytsman's Gen. Insectorum, Fasc. 139, p. 29 (1912).

One ♂, one ♀, August and September, 1909. Schunke.

The *Neoconocephalus flavirostris* of Redtenbacher is very likely nothing more than a form of this species, if not identi-

cal with it. The male listed above has the lateral carinæ of the pronotum distinctly yellowish and the female furnishes measurements more like those given for *flavirostris* than for *subulatus*. The measurements of this pair from Peru are as follows: Length: fastigium of the vertex beyond the eyes, ♂, 4.5 mm., ♀, 5 mm.; pronotum, ♂, 9 mm., ♀, 9 mm.; tegmina, ♂, 38 mm., ♀, 47 mm.; hind femora, ♂, 16.5 mm., ♀, 19.5 mm.; ovipositor, 21 mm.

***Neoconocephalus tenuicauda* Scudder.**

Conocephalus tenuicauda Scudder, Proc. Bost. Soc. Nat. Hist., vol. xii, p. 333 (1869); *Conocephaloides tenuicauda* Kirby, Syn. Cat. Orth., vol. ii, p. 247 (1906); *Neoconocephalus tenuicauda* Karny, Wytsman's Gen. Insectorum, fasc. 139, p. 33 (1912).

One ♀, January, 1909. Schunke.

This specimen is somewhat larger than the type but otherwise agrees very well with the description. It measures as follows: Length, pronotum, 9 mm.; hind femora, 29 mm.; tegmina, 50 mm.; ovipositor, 27 mm.

***Neoconocephalus scudderii* Bolivar.**

Conocephalus scudderii Bolivar, Ann. Soc. Espan., vol. x, p. 497 (1881); *Conocephaloides scudderii* Kirby, Syn. Cat. Orth., vol. ii, p. 247 (1906); *Neoconocephalus scudderii* Karny, Wytsman's Gen. Insectorum, Fasc. 139, p. 33 (1912).

Four ♂♂, three in September and one in November, 1908, by Schunke, and two ♀♀, one November 4, 1906, by Iconnicoff, and one in September, 1908, by Schunke.

. Two of the above males are brown, all the rest are green.

***Neoconocephalus* sp.**

One ♀ nymph, April, 1909. Schunke.

This immature specimen has a short rounded cephalic cone without black marking beneath and the ovipositor is a little longer than the hind femora.

Subfamily CONOCEPHALINÆ

***Conocephalus equatorialis* Giglio-Tos.**

Xiphidium equatorialis Giglio-Tos, Boll. Mus. Torino, vol. xiii, No. 311, p. 92 (1898); *Anisoptera equatorialis* Kirby, Syn. Cat.

Orth., vol. ii, p. 276 (1906); *Conocephalus* (*Neoxiphidion*) *equatorialis* Karny, Wytzman's Gen. Insectorum, fasc. 135, p. 9 (1912).

One ♀, November, 1908. Schunke.

This specimen agrees very well with the original description except that the size is a little greater.

***Conocephalus saltator* Saussure.**

Xiphidium saltator Saussure, Rev. Zool., (2), vol. xi, p. 208 (1859); *Anisoptera saltator* Kirby, Syn. Cat. Orth., vol. ii, p. 276 (1906); *Conocephalus* (*Neoxiphidion*) *saltator* Karny, Wytzman's Gen. Insectorum, fasc. 135, p. 9 (1912).

One ♀, October 21, 1906. Iconnicoff. Also one male nymph which is probably this species, September 28, 1906. Iconnicoff.

This seems to be a very variable species and may eventually prove to contain two or more forms worthy of distinctive names. The posterior femora vary from almost or quite unarmed beneath to distinctly spinose and the pronotum above may be black or unicolorous with the sides. The adult specimen here recorded has a couple of moderate sized ventral spines on the hind femora and the pronotum is infuscated above.

Subfamily AGROECINÆ

***Subria viridis*, new species. (Pl. I, fig. 9.)**

The green color will at once separate this species from the other New World forms of the genus.

Description (♂, the ♀ unknown).—Head barely broader than the pronotum; fastigium of the vertex but gently tapered, rounded above, about as broad as the basal segment of the antennæ and barely extending beyond it, apically rounded and in no ways decurved, beneath continuous with the facial fastigium but at the place of meeting there is a very narrow transverse crease; prosternum unarmed, the sternal lobes short, little developed; pronotum anteriorly and posteriorly truncate, but little produced behind, the disk rounded, slightly flattened posteriorly, merging gradually into the lateral lobes without signs of lateral carinæ; lateral

lobes shallow, much longer than high, the lower margin descending, the deepest point a little behind the middle, the hind margin straight, without humeral sinus. Legs moderately stout, the anterior coxæ armed; anterior tibiæ furnished with conchate foramina and, with the middle tibiæ, unarmed above, beneath armed with strong spines about as long as the tibial depth; hind tibiæ with an apical spine next the apical calcar only on the inner side, armed beneath on the apical half with a few spines, apically in a double row; all the femora unarmed above, the fore and middle ones armed beneath with a few short spines on the cephalic margin only, the hind ones armed beneath on both margins, but a few on the inner margin, those of the outer margin longer, with the extreme tips infuscated; genicular arcs acute-angulate, those of the posterior femora briefly spinose. Tegmina narrow, extending to about the apex of the posterior femora, well beyond the tip of the abdomen, the stridulating angles prominent; wings very nearly as long as the tegmina, transparent greenish in color. Abdomen moderate; last dorsal segment large and broad, and apically narrow and bent down between the cerci as an elongate-triangular diagonally pendent plate, slightly sulcate dorsally and bluntly pointed; subgenital plate apically notched, armed with a pair of very short cylindrical movable styles; cerci stout, laterally somewhat compressed, slightly broader apically and more flattened, the lower apical angle with an acute tubercle, the whole cerci no more than four times as long as broad.

General color uniformly green, the eyes and the extreme tips of the mandibles black; the spines of the posterior femora are also blackish at the extreme tips.

Measurements.—Length: pronotum, 4.5 mm.; elytra, 20 mm.; posterior femora, 10.5 mm.; width: pronotum at posterior border, 3 mm.; elytra at middle, 3 mm.

Described from one ♂.

Type, ♂, November 12, 1906. Iconnicoff.

Type in the collection of the U. S. National Museum.

Cat. No. 21323, U. S. Nat. Mus.

In general appearance this species seems an aberrant member of the genus but it runs out here by published keys and the structural characters agree with those given for *Subria*. The narrow vertex seems to prohibit its being referred to the subfamily Copiphorinæ and besides it does not appear to agree with the description of any genus in that group. Its general appearance is shown in Plate I, figure 9.

***Eschatocerus nigrospinosus* Karny.**

Eschatocerus nigrospinosus Karny, Abhandl. k. k. zool.-bot. Ges. Wien, vol. ix, part 3, p. 64 (1907).

One ♀, October 17, 1906. Iconnicoff. One ♂, one ♀, no date. Schunke.

These specimens fit very exactly the original description of Karny's species.

***Loja subulata*, new species. (Pl. I, fig. 10; Pl. II, fig. 12.)**

This is a much more robust species than *laevis* Giglio-Tos, the only other species known. The fastigium of the vertex is less pointed than in that species and the stridulating vein of the left tegmina is less angularly projected than in the case of *laevis* as illustrated by Karny in Wytsman's Gen. Insectorum, Fasc. 141, plate iv, fig. 10 (1912).

Description (♂ and ♀).—Head moderate, no broader than the pronotum; fastigium of the vertex about as broad as the basal segment of the antenna, the sides about parallel, distally converging very slightly, the tip broadly rounded, the whole not exceeding the basal segment of the antenna in length, evenly rounded dorsally and beneath convergently contiguous with the facial scutellum. Pronotum subtruncate anteriorly and posteriorly, but little produced behind, the disk nearly flat and merging into the lateral lobes with persistent but rounded lateral carinae which diverge very gently at both extremes; lateral lobes much longer than high with rounded angles and very obscure humeral sinus, the lower margin descending posteriorly, the deepest portion behind the middle; prosternum armed with a pair of long spines. Legs moderately stout; fore coxæ armed with a long sharp spine; fore tibiae with conchate foramina on both sides, un-

armed above but armed beneath, as are also the middle ones, with several pairs of medium fixed spines; hind tibiæ armed on both margins above and below, with an apical spine above next the apical calcar on the inner side only; fore and middle femora armed beneath on the cephalic margin only with short stout spines, two on the anterior and three on the middle ones; hind femora strongly swollen in the basal half, armed beneath on both margins with short stout spines, three or four on the inner and four or five on the outer; geniculations of all the femora acutely angulate, those on the inner side of the middle ones and on both sides of the hind ones being spinose. Tegmina but little longer than the pronotum and about half as broad as long, apically broadly rounded, especially in the male; stridulating vein of the left tympanum of the male very thick but not angularly projecting beyond the anal margin. Plate I, figure 10, shows the shape of the tegmina of the male; wings abortive, forming mere padlike projections. Abdomen with the anal segment of both sexes deeply cleft apically, each angle forming a tapering spinelike process; subgenital plate of ♂ triangularly notched apically and furnished with a pair of stout cylindrical apically rounded styles about three times as long as thick, of the ♀ triangular in shape and apically entire, or gently concave; cerci of ♂ short, stout, somewhat compressed, twisted inward and downward apically and with an apical chitinized point, of ♀ simple, round and tapering to a point, the whole about four times as long as basal width and gently curved inward; ovipositor somewhat longer than the pronotum and shaped as in Plate II, figure 12.

General color green, in cabinet specimens yellowish green; the extreme tips of the tibiæ, a spot at the lower end of the foramina of the anterior tibiæ, the apex of the mandibles, and the lateral carinæ of the pronotum, especially the ends, black; the eyes are blackish and the anal margin of the elytra and the tympanum of the ♂ are marked with blackish; none of the above-mentioned black markings are conspicuous, those of the pronotum and the tegmina of the male being the most noticeable; the spines of the legs are mostly tipped with

dusky and the femora all have distinct and quite noticeable piceous spots at the base of each ventral spine; the fastigium of the vertex and the basal segment of the antennæ are slightly brownish and at the vertex of the facial scutellum is a slightly elongate yellowish ocellar spot; the elytra of the ♂ also has a few small but noticeable black spots about the middle.

Measurements.—Length: pronotum, ♂ and ♀, 6 mm.; tegmina, ♂, 11 mm., ♀, 7.5 mm.; posterior femora, ♂, 14 mm., ♀, 15 mm.; ovipositor, 10 mm.; width: pronotum at posterior margin, ♂ and ♀, 4 mm.; ovipositor at widest point, 2.5 mm.

Described from five specimens. Type ♂, December 2, 1906. Iconnicoff. Allotype ♀, November 24, 1906. Iconnicoff. Paratypes a, b, and c, all females, the last a nymph; a and c by Iconnicoff on December 1 and 12, 1906, and b by Schunke in December, 1908.

Type, allotype, and paratype c in the collection of the U. S. National Museum. Paratypes a and b in the collection of Iconnicoff.

Cat. No. 21324, U. S. Nat. Mus.

The paratypes show no variations from the typical.

Dectinomima peruviana, new species. (Pl. II, fig. 15, *b*.)

Similar in structure to *Dectinomima jenningsi* from Panama but smaller and not so black.

Description (♀, the ♂ unknown).—General form stout, having the general aspect of a dectician. Head with the fastigium of the vertex a little narrower than the basal segment of the antenna and scarcely as long, and marked above with a slight longitudinal impressed line, the sides parallel or very slightly convergent and the apex broadly rounded, beneath connected with the frontal fastigium by a very narrow vertical ridge. Pronotum posteriorly more broadly rounded than in *jenningsi* (Pl. II, fig. 15, *a*), and moderately produced, the disk rounded, no trace of lateral carinæ; lateral lobes shallow, the lower margins declivent, the deepest part of the lobe being behind the middle; humeral sinus distinct but shallow; prosternal spines long and sharp. Abdomen short and stout, but little

longer than the pronotum; legs moderately stout, the hind femora strongly swollen in the basal half; fore tibiæ with concate foramina and, like the middle ones, unarmed above but both ventral margins armed with several spines; hind tibiæ armed on both margins above and beneath, above with longer spines for nearly the entire length and beneath with smaller ones only in the apical half and in a clearly double row only apically, above with a spine adjacent to the apical calcar only on the inner margin; all femora armed beneath only, the posterior ones on both margins with moderately long spines and the fore and middle ones on the cephalic margin only with very short stout ones; geniculations acute, that on the caudal side of the middle ones and both sides of the posterior ones more so, being briefly but decidedly spinose. Organs of flight concealed beneath the pronotum.

General color a dark reddish brown, the sides of the abdomen blackish, but not strongly contrasted with the rest of the surface; fore and middle legs lighter with one or two blackish bands on each femora and tibia; lower side of abdomen reddish and the lower part of the head is lighter colored than the dorsal surface; antennæ yellowish banded with black.

Measurements.—Length: Pronotum, 7.5 mm.; posterior femora, 14 mm.; ovipositor, 8 mm. Width: pronotum through middle, by caliper measurement, 5 mm.; ovipositor at thickest part, 2 mm.

Described from two ♀♀. Type, November 25, 1906. Iconnicoff. Paratype a, November 16, 1906. Iconnicoff.

Type in collection of U. S. National Museum; paratype in collection of Iconnicoff.

Cat. No. 21325, U. S. Nat. Mus.

Dectinomima pallida, new species. (Pl. II, figs. 13, 14, and 15, c.)

Allied to the preceding but quite distinctive in general appearance.

Description (♀, the ♂ unknown).—The general form is distinctly more slender than that of the preceding species and the geniculations of the femora appear less acute, those on the

cephalic side of the middle ones scarcely acute. The pronotal disk is posteriorly subtruncate, not nearly so rounded as in the preceding species or in *D. jenningsi*. The entire insect is a lightly mottled grayish yellow except a broad piceous streak on the sides of the abdomen, which is strongly contrasted with the rest of the color and is dimly and very narrowly continued part way along the pronotum; the fore and middle legs are less noticeably banded than in *peruviana* but the antennæ are about as in that species.

Measurements.—Length: pronotum, 7 mm.; hind femora, 15.5 mm.; ovipositor, 10 mm. Width: pronotum through middle, 4.75 mm.; ovipositor, 2 mm.

Described from one ♀, the type, December 12, 1906. Iconicoff.

Type in the collection of the U. S. National Museum.

Cat. No. 21326, U. S. Nat. Mus.

This may eventually prove to be but a variety of *peruviana* but the less rounded posterior margin of the pronotum, lighter coloration, and more slender appearance indicates distinctness.

The genus *Dectinomima* is very closely allied to the genus *Uchuca* of Giglio-Tos and may indeed prove to be the same. The better developed elytra, at least in the female, of *Uchuca* make their separation easy but the males of *Dectinomima*, at the present unknown, may have these organs longer than in the female. The original description of *Uchuca* states that the posterior tibiæ have an apical dorsal spine on each side. This, if true, constitutes an adequate differentiating character, as in *Dectinomima* there is an apical spine above on the inner margin only. But it is possible that Giglio-Tos considered the dorsal calcar on the inner margin a spine and in that case this character conforms with conditions present in *Dectinomima* as illustrated in Plate II, figure 11. The type of *Dectinomima jenningsi* was before Karny when he wrote the fascicule on the Copiphorinæ and he also evidently knows the genus *Uchuca* as he figures the type species of that genus and as he does not merge the two genera, but even follows their respective authors in placing them in separate subfamilies, it is possible that they are really distinct.

Both the above discussed genera could be referred with about equal reason to either the subfamily Copiphorinæ, where *Dectinomima* was originally included, or Agroecinæ, where *Uchuca* has been placed. The fastigium of the vertex varies from a little broader than the basal segment of the antenna to a little narrower and in some specimens there is a slight dorsal impressed line. The coloration and the short falcate ovipositor rather favor their inclusion in Agroecinæ and *Dectinomima* is therefore here referred to that subfamily. It is somewhat doubtful, however, if Agroecinæ should be considered as of subfamily rank as there seems to be no very constant character to separate it from Copiphorinæ. The character used in this connection, the fastigium of the vertex being broader than the basal segment of the antenna in Copiphorinæ and no broader in Agroecinæ, is a slight one upon which to base subfamilies, being unimportant and not very constant. But a combination of characters such as general color, shape of ovipositor, etc., refers most species to one or the other of these two groups with considerable certainty.

The three known species of *Dectinomima* may be separated as follows:

- Fastigium of the vertex fully as broad as the basal segment of the antennæ; pronotal disk semicircularly rounded posteriorly (Pl. II, fig. 15, *a*); abdomen wholly black, the sides no darker than the dorsum.....*jenningsi* Caud.
- Fastigium of the vertex scarcely as broad as the basal segment of the antenna; pronotal disk less rounded posteriorly; abdomen with the sides noticeably darker than the dorsum..... 2
- Pronotal disk distinctly rounded posteriorly (Pl. II, fig. 15, *b*); a stouter and darker species.....*peruviana*, n. sp.
- Pronotal disk subtruncate posteriorly (Pl. II, fig. 15, *c*); a less robust and lighter colored species.....*pallida*, n. sp.

Subfamily PSEUDOPHYLLINÆ

There appears to be much confusion in this entire subfamily and determinations by well-qualified specialists are often made with a query. The generic relationships are not well worked out and a general revision of the group is needed. Brunner laid too much stress on minor characters, such as certain spines

in the tibiæ, etc., but his monograph of 1895 is the most comprehensive revision of the group ever published and is invaluable to the student of these interesting insects.

Bufotettix, new genus.

This genus is remarkable for its small size and short legs of the only known species.

Description.—Head barely as broad as the anterior part of the pronotum and furnished above with a few small granules or tubercles, one near the inner margin of each eye and a pair at the base of the fastigium of the vertex being the only ones of noticeable size; fastigium of the vertex horizontal, triangular in shape, and very small, less than half as broad basally as the basal segment of the antenna and not surpassing the antennal scrobæ, apically minutely notched and not quite meeting the facial fastigium; eyes globular, very prominent, being unusually protuberant; antennæ moderately slender, the basal segment large and furnished with an outer dorsolateral apical tooth, or elongate tubercle; second segment one-half as thick and about one-third as long as the basal one, twice as thick as the succeeding ones, which are cylindrical. Pronotum rugose, the disk flat and gently constricted mesially, somewhat broader posteriorly than anteriorly, the front margin with a mesial well-elevated tubercle, the hind margin truncate and very little prolonged posteriorly; transverse sulci distinct, especially the posterior one; lateral carinæ distinct only on the metanotum; lateral lobes subvertical, almost twice as long as deep, the lower margins straight and horizontal, somewhat thickened, the front angles rectangular, the posterior ones rounded, the posterior margins slanting backward, without distinct humeral sinus; prosternum with a pair of very short blunt spines or tubercles; meso- and metasternum rectangular, about three times as broad as long, the pits far separated and connected by a deep transverse sulcus. Abdomen stout; last dorsal segment apically broadly concave; supraanal plate triangular, longitudinally sulcate dorsally; subgenital plate elongate, apically narrowing and deeply notched, each angle slightly longer than broad and with an apical blunt cylindrical style about three times as long as

broad; cerci bluntly conical, scarcely longer than broad, each about as broad as the subgenital plate and simple. Legs very short, the fore femora shorter than the pronotum and the posterior ones less than twice as long; middle legs missing from the unique type of the only known species; anterior femora unarmed above, beneath armed on the inner margin only with two or three short stout spines on the apical half; fore tibiæ flat and unarmed above, beneath armed with a few very small fine spines, extremely minute on the caudal margin, those on the cephalic margin larger and about five in number; posterior femora stout, but little more than twice as long as the greatest width, only about the apical fifth parallel, unarmed above, beneath armed on the outer margin only with six stout triangular spines, the genicular angles unarmed, as are also those of the fore femora; posterior tibiæ armed above on the caudal margin with eight broad-based spines, the last one near the apex, and on the cephalic margin with three very small depressed apically pointed tubercles on the basal half; beneath on the apical half with several very minute spinules on the cephalic margin, the caudal margin with a few still more minute ones near the apex; the hind tibiæ are without apical calcars above, the lateral and ventral pairs short. Tegmina and wings of equal length, barely reaching the tips of the posterior femora and not far surpassing the tip of the abdomen; tegmina about two and one-half times as long as broad, coriaceous, thick and opaque, the radial veins nearly straight, at the base far separated, gradually drawing nearer toward the apex, the posterior one dividing the tegmina into about equal halves; wings equally long as broad, translucent, the veins yellowish; the outer margin evenly rounded, not at all sinuate.

Type, *Bufotettix alpha*, new species.

Bufotettix alpha, new species.

One of the smallest Pseudophyllids known.

Description (♂, the ♀ unknown).—The characters given in the generic description will serve to distinguish this remarkable little species from all other described members of the subfamily known to me. The tympanum of the tegmina are about

one-fourth as long as the tegmina and about twice as long as broad; the stridulatory vein is stout and does not project at all beyond the inner margin, which is thickened and forms a notch just above the termination of the above vein. The entire surface of the insect, including the elytra, is rugose, the femora and pronotum, especially the latter above, also tuberculate.

General color brown with darker mottlings; sides of pronotum, especially along the sites of the lateral carinæ, blackish and the femora with three illly defined but broad and distinct blackish bands; the tip of the abdomen, including the last dorsal segment, the supraanal and subgenital plates, and the cerci clear yellowish, the dorsal sulcation of the supraanal plate black and the last dorsal segment of the abdomen with a round black dot on each side of the upper surface; the antennæ are irregularly banded with light yellowish and dark brownish.

Measurements.—Length: pronotum, 5 mm.; anterior femora, 4 mm.; posterior femora, 8 mm.; tegmina, 10 mm.; wing, 9 mm. Width: pronotum, posteriorly, 3.25 mm.; tegmina, at middle, 4 mm.; wing, at middle, 8 mm.; posterior femora, at widest point, 3.5 mm.

Described from one ♂, type, August, 1908. Schunke.

Type in the collection of the U. S. National Museum.

Cat. No. 21327, U. S. Nat. Mus.

Orpacophora coronata Linnaeus.

Gryllus Tettigonia coronatus Linnaeus, Syst. Nat., ed. 10, vol. i, p. 430 (1758); *Orpacophora coronata* Kirby, Syn. Cat. Orth., vol. ii, p. 313 (1906).

One ♀, July, 1908. Schunke.

Diacanthodis granosa Brunner.

Diacanthodis granosa Brunner, Monogr. Pseudoph., p. 117 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 315 (1906).

Two ♀ ♀, November, 1908. Schunke.

These female specimens agree very well with the description of the male type. There are eight dorsal spines on the posterior femora instead of seven as in the male as described by Brunner. The measurements of the female are as follows:

Length: pronotum, 5 mm.; anterior femora, 7 mm.; posterior femora, 14.5 mm.; tegmina, 28 mm.; ovipositor, 14 mm.

Width: pronotum, through the middle at lower border of the lateral lobes, by caliper measure, 6 mm.; posterior femora at widest point, 2.75 mm.; ovipositor, at middle, 2 mm.

Pleminia mutica Brunner. (Pl. II, fig. 16.)

Pleminia mutica Brunner, Monogr. Pseudoph., p. 124 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 316 (1906).

Two ♀ ♀, August and December, 1908. Schunke. Also a female nymph evidently of this species December, 1908. Schunke.

In these specimens the dorsal teeth of the middle tibiæ are practically absent, being reduced to mere blunt tubercles. The subgenital plate (Pl. II, fig. 16), has an angulation on each side of the notched apex. These were evidently obscured in Brunner's type, as he makes no mention of them in his description. Aside from this plate the structure of these specimens fits his description very exactly. One of these specimens, the one taken in December, varies from the typical by having some blackish coloration in some of the cells on the tegmina.

The posterior tarsi of this species have the second segment modified above somewhat after the manner of *Saga* as illustrated in my paper on the Saginæ in Fascicule 167, Wytsman's Genera Insectorum, p. 3, pl. ii, fig. 2 (1916).

Lichenochrus amplipennis, new species.

This is a medium-sized species showing relationship to several described forms but apparently referable to none of them. In Brunner's key it runs out to *variabilis* but it does not seem to possess all the characters of that species. It is also apparently related somewhat to *infumatus* Brunner but seems amply distinct from that species.

Description (♂, the ♀ unknown).—Head smooth, of subequal width with the front of the pronotum; eyes round and very prominent; fastigium of the vertex small, triangular, apically slightly notched, above broadly sulcate, the width less than half that of the basal segment of the antennæ and the length but little greater than the basal width, not surpassing the antennal scrobæ, a round tubercle on each side at the base; scutellum of the face abruptly tapering above to a rounded

tubercle, separated from the fastigium of the vertex by a rounded notch; antennæ with the basal segment armed with an apical well-developed but blunt spine on the inner dorsolateral margin. Pronotum slightly rugose on the disk, more so on the metazona; mesozona with a large rounded tubercle on each side of the median line; lateral carinæ present on the metanotum only and there broadly rounded but well elevated, anteriorly forming a rounded shoulder; transverse sulci broad and conspicuous, especially the posterior one, which is situated at the middle of the prothorax, curves frontward below and is intersected at the middle on the dorsal line by a short longitudinal sulcus; prozona with a rounded tubercle on the middle of the anterior margin; posterior margin of pronotal disk broadly rounded, the edge smooth and somewhat thickened; lateral lobes considerably longer than high, the lower margins straight and horizontal, the anterior angles rectangular; humeral sinus deep, rounded-rectangular; prosternum armed with a pair of moderately long spines; meso- and metasternum transverse, the lobes rounded and lateral, not at all prolonged posteriorly; mesosternal pits considerably farther separated from each other than the distance from them to the lateral margins of the sternum and separated by a transverse furrow, those of the metasternum separated scarcely farther than the distance to the edge of the sternum. Legs moderately long and stout, the anterior femora but one-third longer than the pronotum; anterior tibiæ flat and unarmed above, beneath on each margin armed with several small spines, the foramina shell shaped and very moderately expanded; middle tibiæ flat above and unarmed on the cephalic margin, the opposite margin armed with a single short subbasal spine, beneath armed on both margins with several short stout spines; posterior tibiæ armed above and below on both margins with moderately stout spines, the inner ventral margin spined only on about the apical half, no apical spine on the outer dorsal margin; all femora rounded and unarmed above, beneath sulcate and armed on the cephalic margin only, three or four spines on the anterior femora, four larger flattened ones on the middle ones and seven still larger ones on the posterior femora, those toward the apex larger and all curved

backward; caudal geniculations of the middle femora distinctly armed with a long, stout, sharp spine, all the others rounded or very bluntly and briefly armed. Organs of flight fully developed; tegmina nearly three times as long as the pronotum, and about three times as long as broad and rapidly tapering in the apical half by the curving backward of the costal margin, the anal margin of the spread tegmina being nearly straight; radial veins nearly straight and basally well separated but converging toward the apex; speculum of the right tegmen large and transparent, that of the opposite one smaller and coriaceous, the stridulating vein scarcely forming an angle; wings moderately and uniformly fuliginous, about as broad as long, at rest just reaching the apex of the tegmina, the outer margin evenly rounded, not at all sinuate. Abdomen stout; supraanal plate depressed, triangular, a little broader than long, apically entire, slightly concave dorsally; subgenital plate broad and ventrally convex basally, apically narrowed and concave beneath, apically notched, each side with a stout depressed style which is broadest mesially and broadly concave on the inner ventrolateral surface, the whole about twice as long as the median width, the apex rounded; cerci but little longer than broad, conical from an outer dorsolateral aspect, which surface is broadly convex, the inner side deeply and broadly concave, the lower margin curved a little inward and armed with a long slender upwardly and inwardly directed spine which is hidden from view unless the cerci are raised for examination.

General color brownish yellow varied with darker, especially on the elytra; the posterior femora have a broad dark brownish band a little beyond the middle, a similar preapical band and a darker and more conspicuous area on the dorsal and upper half of the outer surface at about the basal third, at the widest part of the femora. The spines of the legs are infuscated apically. The short median longitudinal sulcus of the pronotal disk is black and there is an irregular blackish stripe marking the site of lateral carinæ on the posterior half of the pronotum. The face is concolorous with the rest of the head.

Measurements.—Length: pronotum, 8 mm.; anterior femora, 12 mm.; posterior femora, 20 mm.; tegmina, 30 mm.; wings, 28 mm.; anal styles, 2 mm.; cerci, 2 mm. Width: pronotum at posterior margin, 5.5 mm.; tegmina at widest point, at about the basal third, 10 mm., at apical fourth, 5 mm.; wing at widest point, 24 mm.; posterior femora at widest point, 5 mm.; anal styles, 1 mm.; cerci, 1.75 mm.

Described from two ♂♂, type, December, 1908. Schunke. Paratype, September, 1909. Iconnicoff.

Type in the collection of the U. S. National Museum; paratype in the collection of Iconnicoff.

Cat. No. 21328, U. S. Nat. Mus.

Acanthodis aquilina Linnaeus.

Gryllus Tettigonia aquilinus Linnaeus, Syst. Nat., ed. 10, vol. i, p. 430 (1758); *Acanthodis aquilina* Kirby, Syn. Cat. Orth., vol. ii, p. 318 (1906).

One ♂, no date. Schunke.

This specimen agrees very well with the figure and description in Brunner's monograph.

Stenoschema gracile Brunner.

Stenoschema gracile Brunner, Monogr. Pseudoph., p. 137 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 319 (1906).

One ♂, October 11, 1908. Schunke. Also a female nymph determined doubtfully as this species, June 12, 1906. Iconnicoff.

This male specimen appears typical with the exception of the tegmina appearing somewhat narrower than stated in the original description, being barely more than 3 mm. in width.

Leurophyllum unicolor Brunner.

Platyphyllum unicolor Brunner, Monogr. Pseudoph., p. 139 (1895). *Leurophyllum unicolor* Kirby, Syn. Cat. Orth., vol. ii, p. 320 (1906).

One ♂, December 15, 1906. Iconnicoff. Three ♀♀, January, 1906, April and September, 1908. Schunke.

These specimens fit Brunner's description very well. The ventral spines of the anterior femora vary in number from one to three.

The male, hitherto undescribed, runs out in Brunner's key to *granulosum* but is too small for that species, being more as in *guttatum* in this respect but differing from this species in others. The elytra are broader basally than in the female and more acutely pointed apically. The cerci are bifid apically, the upper branch much shorter than the lower one; subgenital plate narrowed apically and with a U-shaped apical notch and a pair of cylindrical slender styles about ten times as long as broad. The breast is piceous, as is also the face. The measurements of the single male represented in this collection are as follows: Length: pronotum, 7.25 mm.; anterior femora, 7 mm.; posterior femora, 16 mm.; tegmina, 26 mm.; anal styles, 2 mm. Width: pronotum, posteriorly, 4.5 mm.; tegmina, at base, across speculum, 6.5 mm., at middle, 5 mm.; posterior femora, 3.1 mm.

The tegmina of the female are noticeably marked with darker zigzag markings of variable distinctness, a character scarcely indicated in the male discussed above and at variance with the original diagnosis. It is possible that the above male is wrongly associated with the females but without additional material it is thought best not to characterize it as distinct at this time.

The wings of this species are very lightly fuliginous in both sexes and in this character stands intermediate between the clear-winged genus *Platyphyllum* of Serville and the fuliginous-winged *Leurophyllum* of Kirby. This character seems to be about the only one so far given for the separation of these two genera and it appears of little value for the purpose. But a structural character may exist to serve for their separation, though I have insufficient knowledge of the forms to point such out at this time.

***Leurophyllum brevixiphum* Brunner.**

Platyphyllum brevixiphum Brunner, Monogr. Pseudoph., p. 140 (1895); *Leurophyllum brevixiphum* Kirby, Syn. Cat. Orth., vol. ii, p. 320 (1906).

One ♂ and one ♀, April and July, 1909. Schunke.

Leurophyllum maculipenne Serville.

Platyphyllum maculipenne Serville, Ins., Orth., p. 447 (1839);
Leurophyllum maculipenne Kirby, Syn. Cat. Orth., vol. ii, p. 320
(1906).

One ♂, September 9, 1906. Iconnicoff.

Meroncidius flavolimbatus Brunner.

Meroncidius flavolimbatus Brunner, Monogr. Pseudoph., p. 150
(1895); Kirby, Syn. Cat. Orth., vol. ii, p. 322 (1906).

One ♀, September, 1908. Schunke.

Meroncidius marginatus Walker.

Meroncidius marginatus Walker, Cat. Derm. Salt. Brit. Mus.,
vol. iii, p. 450 (1870); Kirby, Syn. Cat. Orth., vol. ii, p. 322
(1906).

One ♂, November, 1906. Iconnicoff. Three ♀ ♀, January
and February, 1909. Schunke.

The above male appears rather small for this species but otherwise agrees very well with the original diagnosis. It measures as follows: Length: pronotum, 8 mm.; anterior femora, 11 mm.; posterior femora, 18.5 mm.; tegmina, 29 mm. Width: pronotum posteriorly, 5 mm.; tegmina mesially, 8.5 mm.; posterior femora at widest point, 3 mm.

From an examination of type material in the British Museum I conclude that *Meoncidius inornatus* and *M. indistinctus* Walker are both synonymous with *marginatus*. Why Kirby, Syn. Cat. Orth., vol. ii, p. 332 (1906), places *indistinctus* in the genus *Bliastes* is not clear.

Meroncidius sp.

One ♂, December 4, 1916. Iconnicoff.

This is very like the male recorded above as *M. marginatus* and may be but a shorter-winged form of that species, the somewhat shorter organs of flight being the main difference noted. The tegmina of this specimen measures 25 mm. in length.

Meroncidius atricauda, new species.

This apparently undescribed form is structurally related to *M. flavolimbatus* Brunner and also to *M. innotatus* Walker, a

species belonging to and described in the present genus but listed by Kirby in the genus *Leptotettix*. But this Peruvian species is smaller and more slender than either of the above allied forms.

Description (♂).—Head smooth, no broader than the pronotum; eyes round and prominent; fastigium of the vertex elongate triangular, dorsally broadly sulcate, apically slightly elevated and not surpassing the antennal scrobæ; there is a pair of rounded tubercles at the base of this fastigium and beneath the fastigium meets that of the face but projects considerably beyond the point of juncture; basal segment of the antenna with a short stout apical spine on the inner dorsolateral margin; antennal scrobæ well developed, continued below the eyes as a transverse ridge. Thorax entirely beset with a dense mass of rounded tubercles; pronotal disk without lateral carinæ, the disk roundly subtruncate anteriorly and posteriorly, the anterior margin with a very broad slightly developed mesial tubercle; lateral lobes decidedly longer than high, the lower margins straight, fore and hind margins slightly convergent, the humeral sinus shallow. Legs short, the anterior femora scarcely one-half longer than the pronotum; anterior tibiæ flat and unarmed above, beneath with five or six small sharp spines on each margin; middle tibiæ armed beneath as in the anterior ones, above flat and armed on the caudal margin on the basal half with one or two small sharp depressed spines; posterior tibiæ rectangular in section, armed above and beneath on both carinæ with a number of small spines, those of the upper side the larger, and with an upper apical spine on the caudal margin only; femora with all the geniculations spined except the cephalic ones of the middle legs, which are narrowly rounded; anterior and intermediate femora armed beneath with four short stout spines on the cephalic margin, the opposite margin unarmed; posterior femora armed beneath with a row of eight or nine stout spines on the cephalic margin only, those toward the apex the larger and all apically somewhat curved backward; all the femora unarmed above. Organs of flight fully developed; wings lightly fuliginous, a little longer than broad, apically subtruncate; tegmina about four times as long as the pronotum,

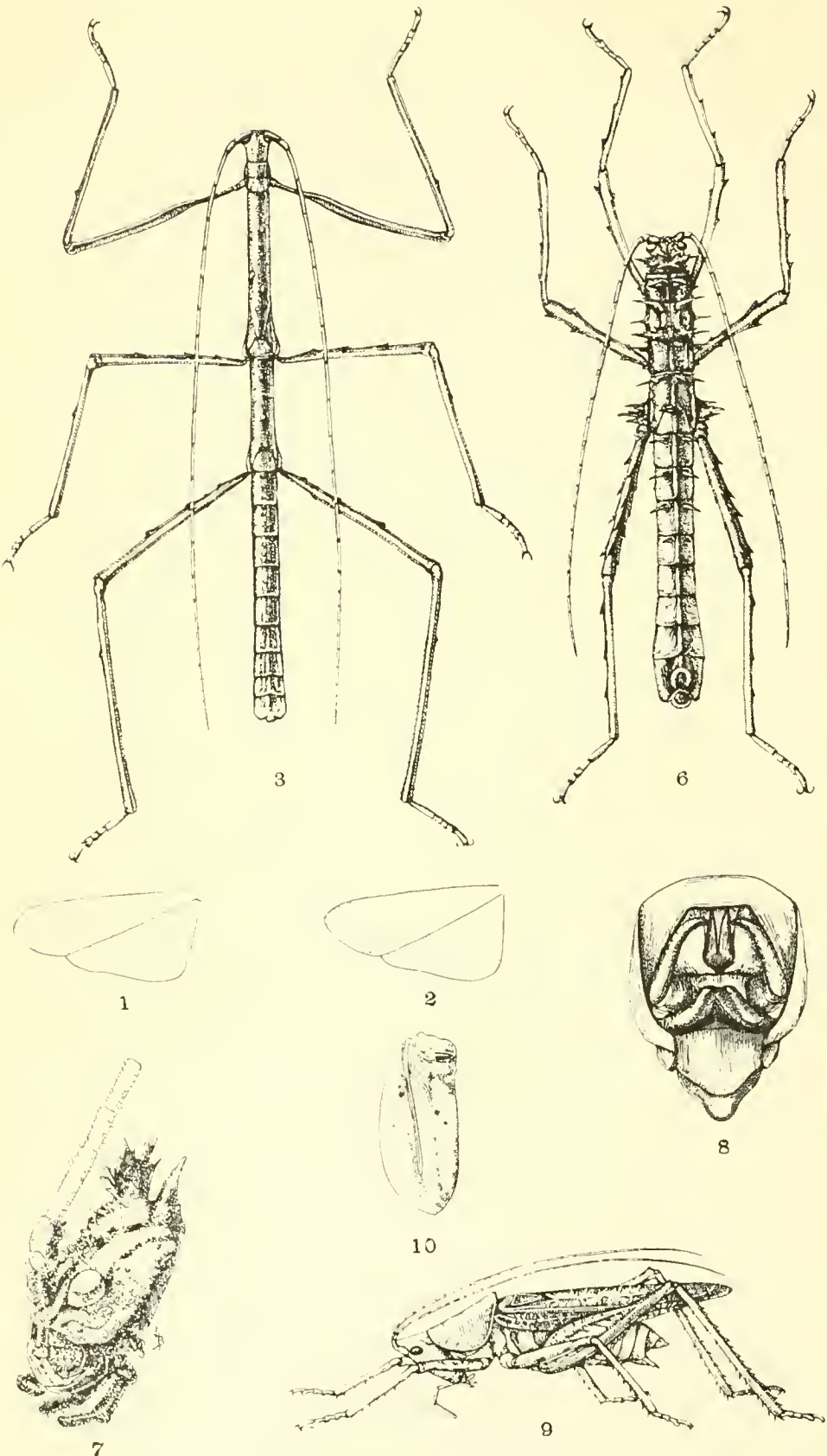
EXPLANATION OF PLATE I¹

- Fig. 1. *Paratropes acuatorialis* Saussure. (Left wing.)
2. *Paratropes mexicana* Brunner. (Left wing.)
3. *Dyme icconnicoffi*, new species. (Male type, dorsal view.)
6. *Acanthaclonia flavicornis*, new species. (Male type, dorsal view.)
7. *Acanthaclonia flavicornis*, new species. (Head of male type, lateral view.)
8. *Hyperbaenus brevipennis*, new species. (Abdomen of male type, caudal view.)
9. *Subria viridis*, new species. (Male type.)
10. *Loja subulata*, new species. (Left tegmen of male type.)

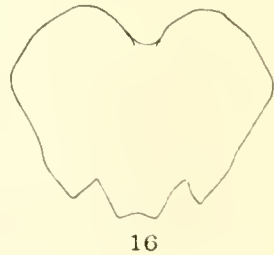
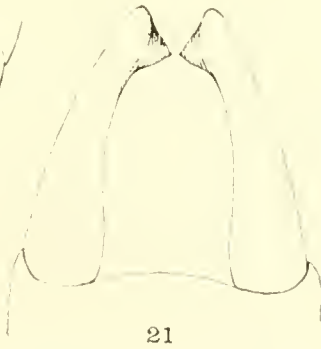
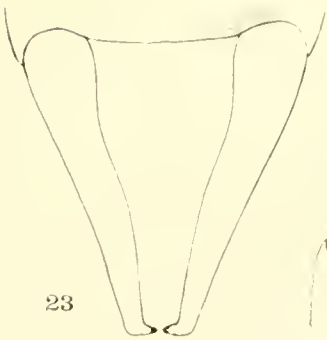
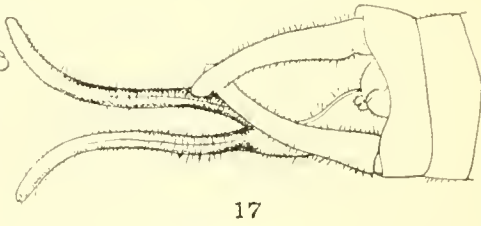
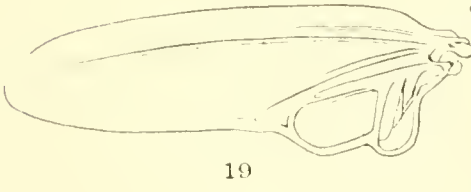
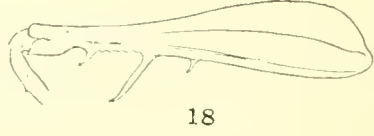
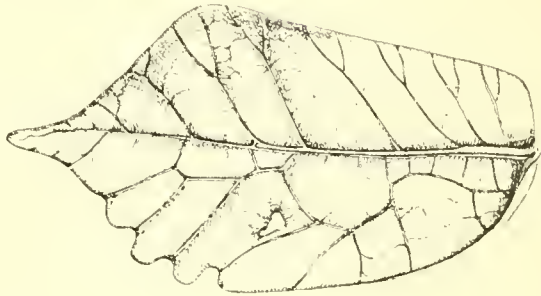
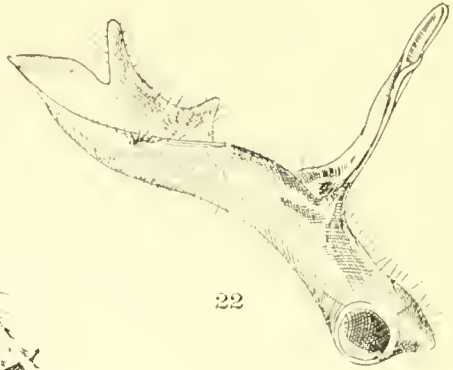
EXPLANATION OF PLATE II

- Fig. 12. *Loja subulata*, new species. (Ovipositor of allotype.)
13. *Dectinomima pallida*, new species. (Female type.)
14. *Dectinomima pallida*, new species. (Tip of posterior tibia of female type.)
15. a.—*Dectinomima jenningsi* Caudell. b.—*Dectinomima peruviana*, new species. c.—*Dectinomima pallida*, new species. Posterior margin of pronotal disk of type specimens.
16. *Pleinina mutica* Brunner. (Subgenital plate of female.)
17. *Semileptotettix flagellata*, new species. (End of abdomen of male type, subdorsolateral view.)
18. *Arrhenotettix calcaratus*, new species. (Posterior femora of male type.)
19. *Hoplotettix icconnicoffi*, new species. (Left tegmen of male type, in outline.)
20. *Typophyllum undulatum*, new species. (Right tegmen of female type, drawn from the inner surface.)
21. *Anaulacomera apicidentata*, new species. (Cerci of male type, dorsal view.)
22. *Anaulacomera cercalis*, new species. (Cercus of male type, subventral view.)
23. *Anaulacomera simplex*, new species. (Cerci of male type, dorsal view.)

¹There are no figures 4, 5, or 11.



ORTHOPTERA OF PERU



apically rounded by the curving upward of the anal margin more than the backward curving of the anterior margin; radial veins well separated basally. Supraanal plate narrowly and shallowly sulcate above, a little longer than broad, narrowing apically, the tip very broadly rounded; subgenital plate very narrow and elongate, sulcate above and below and apically with a deep V-shaped incision, each flange about one and one-half times as long as broad, apically truncate and furnished with a bluntly pointed style about as long as the flange itself but somewhat narrower; cerci short, stout, and cylindrical, very gently curved inward and apically with a small swelling on the inner side and with a short, sharp black tooth.

General color yellowish brown; femoral spines black to near the tip where there is a light area, the very tip itself blackish; hind femora black beneath in the basal half and on the lower half of the inner face basally; last segment of the abdomen infuscated; face concolorous.

(♀). Very similar to the male except the cerci are longer, simple, and pointed, and the subgenital plate elongate-triangular and apically entire. Ovipositor stout and noticeably longer than the pronotum, straight above, apically sharply pointed by the curving upward of the ventral margin in the apical third; upper margin finely serrate in the apical half; color about as in the opposite sex, the black of the apex of the abdomen more intensified; ovipositor black in the apical half, continued as a narrow ventral streak to the base and an elongate spot of the same color on the dorsal surface in the basal half.

Measurements.—Length: pronotum, ♂, 7 mm., ♀, 7.5 mm.; tegmina, ♂, 32 mm., ♀, 35 mm.; wings, ♂, 30 mm., ♀, 32 mm.; anterior femora, ♂, ♀, 10 mm.; posterior femora, ♂, ♀, 19 mm.; subgenital plate, including styles, ♂, 10 mm.; ovipositor, 16 mm. Width: pronotum posteriorly, ♂, ♀, 5 mm.; tegmina mesially, ♂, 9 mm., ♀, 9.5 mm.; wings, ♂, ♀, about 25 mm.; ovipositor mesially, 2.75 mm.

Described from one ♂ and two ♀♀. Type, ♂, October 9, 1908. Schunke. Allotype, ♀, November 29, 1906. Iconnicoff. Paratype, ♀, November, 1906. Iconnicoff.

Type and allotype in the collection of the U. S. National Museum. Paratype in the collection of Iconnicoff.

Cat. No. 21329, U. S. Nat. Mus.

The paratype appears to have been killed before the color was completely developed as the black coloration of the ovipositor is not nearly so evident as in the allotype, though otherwise it appears about typical.

Bliastes connexus Brunner.

Bliastes connexus Brunner, Monogr. Pseudoph., p. 192 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 332 (1906).

One ♂, April, 1909. Schunke.

Bliastes spinicornis, new species.

Description (♂, the ♀ unknown).—Basal segment of the antenna with a stout sharp apical spine on the inner margin and the second segment has an acute basal tubercle on the ventral margin; the fastigium of the vertex is elongate-triangular, apically pointed and not exceeding the well-developed antennal scrobæ, dorsally sulcate and with a pair of low basal tubercles; the fastigium of the vertex is separated from that of the face by a broad rounded notch. Pronotum rounded above, and entirely covered with tubercles, lateral carinæ indicated only posteriorly and there very roundly so; pronotal disk broadly rounded posteriorly and anteriorly, the front margin with a yellowish ridge; lateral lobes about twice as long as high, the lower margin horizontal and straight and margined with a yellowish thickened border similar to that of the anterior margin of the pronotal disk; humeral sinus scarcely developed; prosternum unarmed, only tuberculate; metasternum moderately narrowed posteriorly, the pits merged into one transverse opening. Tegmina barely attaining the tip of the abdomen, apically rounded, the margins parallel; tympanum nearly round, projecting well beyond the anal margin, the membrane opaque on the left tegmen; wings broad, at rest as long as the tegmina, the outer margin broadly and evenly rounded, the membrane lightly fuliginous, the veins slightly darker. Legs moderate in length; anterior coxæ distinctly armed; all genicular arcs spinose except the cephalic ones of the intermediate femora,

which are rounded; anterior and intermediate femora armed beneath on the cephalic margin only with two or three spines and the posterior ones with five or six; anterior and intermediate tibiæ sulcate and unarmed above, beneath armed on each side with several small spinules, the hind tibiæ armed above and below on both margins, above with an apical spine on the caudal margin only; foramina of the anterior tibia shell-shaped. Abdomen moderately robust; supraanal plate large and broad, dorsally narrowly sulcate, apically roundly truncate; subgenital plate apically narrowed, shallowly notched and furnished with a pair of stout cylindrical roundly pointed styles noticeably longer than the apical width of the plate; cerci stout, cylindrical, apically broadly rounded and armed with a short inwardly directed tooth.

General color brown, the legs yellowish brown and, especially the posterior femora, with several light colored rounded spots; spines of the legs with the extreme tips blackish.

Measurements.—Pronotum, 5.5 mm.; anterior femora, 7 mm.; posterior femora, 12.5 mm.; tegmina, 14 mm. Width, tegmina mesially, 4.5 mm.; wings mesially, 10 mm.; posterior femora at widest point, 3 mm.

Described from two specimens: Type a single ♂, November 21, 1906; paratype ♂, December 1, 1906. Both by Iconnicoff.

Type in the collection of the U. S. National Museum; paratype in the collection of Iconnicoff.

Cat. No. 21330, U. S. Nat. Mus.

Cocconotus olivaceus, new species.

This handsome large dull reddish olive colored species is apparently allied to *Cocconotus festae* Giglio-Tos from Ecuador.

Description (♂).—Pronotal disk somewhat rugose with large rounded tubercles of little elevation; posterior transverse sulcus only conspicuous, situated a little caudad of the middle. Intermediate tibiæ armed above on the outer margin with four short stout spines. Cerci cylindrical, curved inward and the apex forming a short black tooth, apically notched; supraanal plate triangular, dorsally sulcate; subgenital plate long and

narrow, extending beyond the tips of the cerci, mesially longitudinally concave above and beneath, the tip deeply but roundly incised and provided with a pair of somewhat apically expanded styles over half as long as the plate itself.

General color of head, body, and legs yellowish brown except the posterior femora which are tinged with dull olive green; pronotum with a broad black dorsal stripe; spines of the femora black apically and basally, mesially yellowish; tegmina distinctly olivaceous except the anal area, which is brownish. The tips of the mandibles and the top of the head are also blackish.

(♀). Same as the male. Ovipositor long, moderately broad and blackish in the apical third; subgenital plate apically blackish and notched; cerci cylindrical, curved inward in the apical half and apically pointed.

Measurements.—Length: pronotum, ♂, 9 mm., ♀, 9.5 mm.; tegmina, ♂, 48 mm., ♀, 53 mm.; wing, ♂, 45 mm.; anterior femora, ♂, 13 mm.; ♀, 14 mm.; posterior femora, ♂, 27 mm., ♀, 29 mm.; anal styles, ♂, 5.5 mm.; ovipositor, 28 mm. Width: pronotum posteriorly, ♂, ♀, 6 mm.; tegmina mesially, ♂, 12 mm., ♀, 12.5 mm.; wings mesially, ♂, 36 mm.; posterior femora. at widest part, ♂, ♀, 6 mm.; ovipositor mesially, 4 mm.

Described from eight ♂♂ and eight ♀♀. Type, ♂, January, 1909. Schunke. Allotype, ♀, same date. Paratypes a, b, c, d, January, e, f, February, 1909, males, g, h, i, j, February, k, August, l, November, 1909, females.

Type, allotype, and paratypes d, e, g, h, and k in the collection of the U. S. National Museum; paratypes a, b, c, f, i, j and l in the collection of Iconnicoff.

Cat. No. 21331, U. S. Nat. Mus.

In the key given by Giglio-Tos, Boll. Mus. Torino, vol. xiii, No. 311, p. 95-97 (1898), the above species runs out to *festæ*. That species, however, has the base of the antennæ black while in the species here described the antennæ are yellowish brown.

Cocconotus nigroantennatus Brunner.

Cocconotus nigroantennatus Brunner, Monogr. Pseudoph., p. 207 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 335 (1906).

One ♂, three ♀ ♀, November 19, 21, and 29, 1916. Iconnicoff.

The tegmina of these specimens vary slightly in the infuscation of the crossveins and the ovipositor is apically infuscated in two of the females and concolorous in the third.

Cocconotus similis, new species.

An inconspicuous species allied to *modestus* Brunner from Guatemala and Honduras but distinguishable from that species as described by Brunner in having the subgenital plate apically deeply notched.

Description (♀, the ♂ unknown).—Head barely as broad as the front part of the pronotum; fastigium of the vertex very small, triangular, scarcely more than half as long as the antennal scrobæ, dorsally slightly sulcate and with a pair of prominent basal tubercles; beneath this fastigium is continuous with that of the face but projects somewhat beyond the junction, forming a broad rounded notch; eyes somewhat longer than broad and very prominent; antennal scrobæ well developed but much shorter than the basal segment of the antenna, beneath which they are continued as a transverse ridge; basal segment of the antenna with an apical tubercle on the inner dorso-lateral margin; pronotum wholly and densely covered with moderate sized, smooth, rounded tubercles, none of which are much if any more than one-half as high as broad; disk evenly rounded into the lateral lobes without indication of lateral carinæ except a slight shoulder on the metanotum; anterior margin of the pronotal disk truncate, the posterior margin broadly rounded; lateral lobes somewhat longer than high, lower margin straight and horizontal, front margin nearly vertical, the opposite one moderately slanting, the humeral sinus broad; legs moderately stout, the anterior femora about one and one-half times as long as the pronotum; anterior and intermediate tibiæ flat and unarmed above, beneath armed on both sides with several small spines; foramina shell-shaped, the sides not widely extended; posterior tibiæ armed above and below on both margins with several moderate sized spines, an apical spine above on the caudal side only; all the femora unarmed

above and with the geniculations unarmed except the caudal ones of the intermediate and posterior femora, which are distinctly spined; anterior and intermediate femora armed beneath on the cephalic margin only with three or four triangular spines; posterior femora armed beneath on the outer margin with seven stout spines, those toward the apex the larger and curved slightly backward. Organs of flight fully developed; tegmina five times as long as the pronotum, apically somewhat narrowly rounded, the radial veins very close together except near the base where they are separated by a space something over twice the width of one of them; wings about the same length as the tegmina and nearly as broad as long and very slightly fuliginous. Supraanal plate broadly triangular, apically rounded and dorsally shallowly and broadly concave; subgenital plate elongate and apically deeply cleft; cerci cylindrical, simple and moderately stout, about four times as long as broad, gently tapered to a point, and gently incurved, ovipositor moderately slender, three times as long as the pronotum, gradually tapering from the base to the sharply pointed apex, the upper margin very finely and bluntly serrate in the apical half.

General color yellowish brown; the femoral spines are piceous basally with the tips generally reddish yellow, the spines of the tibiae are reddish yellow with infuscated tips.

Measurements.—Length: pronotum, 6.5 mm.; anterior femora, 9 mm.; posterior femora, 19 mm.; tegmina, 32 mm.; ovipositor, 18 mm. Width: pronotum posteriorly, 5.5 mm.; elytra mesially, 8.5 mm.; ovipositor mesially, 2.5 mm.

Described from one ♀, type, November, 1908. Schunke.

Type in the collection of the U. S. National Museum.

Cat. No. 21332, U. S. Nat. Mus.

Cocconotus angustatus Brunner.

Cocconotus angustatus Brunner, Monogr. Pseudoph., p. 210 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 336 (1906).

One ♂, January, 1909. Schunke.

Cocconotus variabilis, new species.

This is a somber-colored species running to section 1' of

Brunner's key, those forms having the intermediate tibiæ spined above. To place it further in the above-mentioned key would necessitate a general recast of the arrangement, a task not considered advisable at this time by reason of the lack of sufficient material to make such a recast satisfactory.

Description (♂).—Head smooth, about as broad as the front portion of the pronotum; eyes slightly elongate and quite prominent; fastigium of the vertex surpassed somewhat by the antennal scrobæ, elongate-triangular, narrowly rounded apically, longitudinally sulcate dorsally, the margins elevated basally into a pair of oblongly rounded tubercles with a light yellowish ocellar spot on the outer aspect; basal segment of the antennæ with an elevated apical tubercle on the inner dorsolateral margin, the second segment with a smaller basal tubercle; antennal scrobæ moderate, slightly surpassing the fastigium of the vertex; facial scutellum smooth, apically narrowing to a narrowly rounded fastigium separated from that of the vertex by a broadly rounded notch; just below the apex of the facial scutellum there is an oblong light yellowish spot similar to that on the outer aspect of the basal tubercles of the fastigium of the vertex. Pronotum entirely beset with coarse tubercles, the disk rounded into the lateral lobes without signs of lateral carinæ except slight shoulders on the metanotum; lateral lobes somewhat longer than high, lower margin straight and nearly horizontal, angles rounded, humeral sinus broadly rounded; pronotal disk very broadly rounded at both extremities, posteriorly mesially notched and almost truncate; posterior transverse sulcus very distinct, a little behind the middle; a short median carina on the posterior edge of the metanotum and a short longitudinal furrow at the point of crossing of the posterior transverse sulcus; prosternum with a pair of blunt thorns; meso- and metasternal lobes triangularly rounded; metasternal pits so close together as to be practically merged, a dividing ridge present only anteriorly. Legs moderately slender, the fore femora one and one-half times as long as the pronotum; anterior tibiæ perfectly flat above and unarmed, the foramina shell-shaped and but little inflated; beneath these tibiæ are armed with seven spines on each margin, those of each row nearly opposite the

others; middle tibiæ similar in ventral armature to the anterior ones but the spines less nearly opposite each other, above armed on the caudal margin only with four very small but distinct triangular teeth; posterior tibiæ armed above and beneath on both margins with black based spines, an apical one above on the caudal margin only; all femora unarmed above, the geniculations rounded except the caudal ones of the intermediate and posterior legs which are spined; anterior and intermediate femora armed beneath on the cephalic margin only with four short triangular spines; posterior femora strongly swollen in the basal two-thirds and armed beneath on the outer carina with five or six stout spines, those toward the apex the longer and somewhat curved. Organs of flight fully developed, the tegmina moderately slender and more than four times as long as the pronotum, considerably tapered in the apical half, the tip somewhat narrowly rounded; radial veins separated for most of their length by a distance equal to about twice the width of one of them; tympani small, that of the right tegmen transparent, that of the opposite one coriaceous, the stridulating vein not at all projecting beyond the inner margin; wings of about equal length with that of the tegmina and about as broad as long, very slightly fuliginous. Last abdominal segment apically very deeply and broadly incised, the margin fringed with fine long hairs; supraanal plate partly concealed but apparently broadly rounded apically; subgenital plate moderately elongate, triangularly notched apically and furnished with a pair of cylindrical slightly clavate and apically broadly rounded styles about four times as long as broad and, like most of the apical portion of the whole abdomen, covered with short pile; cerci cylindrical, short, scarcely four times as long as broad, apically moderately incurved and armed with a subapical chitinized tooth on the inner side.

General color yellowish brown; head infuscated on the occiput and the pronotum blackish on the metanotal shoulders from the posterior transverse furrow backward and across the full width of the posterior edge of the pronotal disk, the anterior margin of which is also narrowly blackish; spines of the legs piceous with the apices tinged with reddish, those of the an-

terior and intermediate femora almost wholly black; there is also a longitudinal black spot on the mesopleura.

(♀). Very similar to the ♂ in color and structure, the main differences observed being as follows: prosternal spines reduced to pointed tubercles and the meso- and metasternal lobes more broadly rounded; the left anterior femora has but three vertical teeth and the posterior femora have seven ventral teeth on one leg and eight on the other, the basal ones scarcely more than mere black tubercles; the caudal geniculations of the posterior femora are rounded and the corresponding ones of the intermediate femora are less sharply spined than in the case of the male. Cerci simple, about five times as long as broad, tapering to a point and incurved; supraanal plate mostly concealed in the allotype but probably agrees with that of the paratypic female, which is transverse and broadly rounded apically, slightly sulcate above; subgenital plate apically notched; ovipositor about twice as long as the pronotum, broad at the base and tapering gradually in a little more than the apical half to a point, the margins almost smooth. Color about as in the opposite sex but slightly less infuscated on the occiput; ovipositor of a reddish cast apically.

Measurements.—Length: pronotum, ♂, 5.5 mm., ♀, 6.5 mm.; anterior femora, ♂, 8.5 mm., ♀, 10 mm.; posterior femora, ♂, 18 mm., ♀, 20 mm.; tegmina, ♂, 29 mm., ♀, 31 mm.; ovipositor, 15 mm. Width: pronotum posteriorly, ♂, 4 mm., ♀, 4.5 mm.; tegmina at widest point, which is at about the basal third, ♂, 7.75 mm., ♀, 8 mm.; posterior femora at widest point, ♂, 4 mm., ♀, 4.5 mm.; ovipositor basally, 3.5 mm., mesially, 2.5 mm.

Described from one ♂ and two ♀♀. Type ♂, March 18, 1906. Iconnicoff. Allotype, ♀, March 12, 1906, Iconnicoff. Paratype, ♀, November 9, 1906. Iconnicoff.

Type and allotype in the collection of the U. S. National Museum; paratype in the collection of Iconnicoff.

Cat. No. 21333, U. S. Nat. Mus.

The paratype recorded above appears to be a stunted specimen, being somewhat smaller than the allotype. Besides the difference in size this specimen shows the following differences:

prosternal spines as long as in the male and the meso- and metasternal lobes as in that sex; anterior femora with three ventral spines and the posterior ones with six, one with a seventh represented by a black spot; anterior tibiæ with seven ventral spines on the cephalic margin of one leg and eight on the other, while the spines of the opposite margin are noticeably smaller and less oppositely placed than in the type material; here all the femoral geniculations are rounded and the color of the face, instead of being concolorous with the rest of the surface as in the type and allotype, is mesially largely pea-green. The measurements of this specimen are as follows: Length: pronotum, 6 mm.; anterior femora, 7.5 mm.; posterior femora, 15 mm.; tegmina, 24 mm.; ovipositor, 15 mm. Width: pronotum posteriorly, 4 mm.; tegmina at widest point, 5 mm.; posterior femora at widest point, 3.5 mm.; ovipositor mesially, 2.5 mm.

Nannotettix sp.

Three nymphs, two ♂ ♂ and one ♀, November 19, December 2 and 12, 1906. Iconnicoff.

In general appearance these immature specimens remind one of the species described from Peru under the name *Nannotettix paltaybama*¹ but the ovipositor of the female seems entirely too heavy for that species.

It may be well to here record the fact that after the description of *Nannotettix paltaybama*, based on the male only, was printed there was an adult female received from Huadquinia, Peru, also taken by the Yale Peruvian Expedition of 1911 but bearing no date. This specimen scarcely differs from the male type except that the pronotal disk has three longitudinal black spots anteriorly instead of being wholly black along that border. The ovipositor is moderately stout and quite gradually tapered to a sharp point. The posterior legs of this specimen are both missing. The measurements are as follows: Length: pronotum, 9 mm.; tegmina, 11 mm.; ovipositor, 17 mm.; width, pronotum posteriorly, 6 mm.; ovipositor mesially, 2.5 mm.

¹Caudell, A. N., Proc. U. S. Nat. Mus., vol. xliv, p. 351 (1913).

Macrochiton adjutor Brunner.

Macrochiton adjutor Brunner, Monogr. Pseudoph., p. 220 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 338 (1906).

Four ♀ ♀, October and November, 1908, and January, 1909, all by Schunke.

The ventral armature of the posterior femora exhibited by these four specimens is very variable, there being from one to five spines on the inner margin and the same range on the outer. The anterior femora are unarmed beneath on the caudal margin and armed on the cephalic margin with from one to three short spines; the middle femora are unarmed beneath on the caudal margin and also on the cephalic margin or armed there with a single small spine.

This somber colored long legged insect superficially resembles very closely the following species.

Leptotettix pubiventris Bolivar.

Leptotettix pubiventris Bolivar, An. Soc. Espan., vol. x, p. 493 (1881); Kirby, Syn. Cat. Orth., vol. ii, p. 339 (1906).

One ♂, October, 1908, one ♀, December, 1908, both by Schunke.

Except for sexual differences the female is essentially like the male. There is some variation in the ventral armature of the femora. Thus the right intermediate femora of the male has a single ventral spine of considerable size while in all others it is unarmed as in the type. The posterior femora have from two to four ventral spines and in both specimens now under consideration the anterior femora have but two ventral spines. The anterior tibiae are a little shorter than indicated in the original description of the species. The measurements of the present pair are as follows:

Length: pronotum, ♂, 5.5 mm., ♀, 6 mm.; anterior femora, ♂, 13 mm., ♀, 13.5 mm.; posterior femora, ♂, 28 mm., ♀, 31 mm.; tegmina, ♂, 52 mm., ♀, 54 mm.; ovipositor, 22 mm. Width: pronotum posteriorly, ♂, 4 mm., ♀, 4.5 mm.; tegmina about the apical sixth, the widest point, ♂, 10.5 mm., ♀, 11 mm.; posterior femora at widest point, ♂, ♀, 4 mm.; ovipositor mesially, 3.75 mm.

The tympanum of the tegmina of this species are very small and that of the left one is wholly coriaceous and very inconspicuous.

Semileptotettix flagellata, new species. (Pl. II, fig. 17.)

Runs out to *vittatus* in Brunner's keys but is quite different from that species in several respects, especially size and the genital structure of the male.

Description (♂).—Head smooth, about as broad as the anterior portion of the prothorax; eyes circular and decidedly prominent; fastigium of the vertex very small, twice as long as broad, flat dorsally, barely attaining the tips of the antennal scrobæ and with a pair of prominent basal tubercles, the lateral aspect of which bear light yellowish ocellar spots; facial scutellum narrowed above and separated from the fastigium of the vertex by a broad rounded notch, an oblong yellowish ocellate spot near the vertex; antennal scrobæ well developed, continued beneath the antennæ as transverse ridges; basal segment of the antennæ armed with a prominent apical spine on the inner dorsolateral margin. Pronotum covered with small rounded tubercles; disk rounded into the lateral lobes without indication of lateral carinæ other than mere rounded shoulders on the metanotum, both margins rounded and with a small median light yellowish tubercle, the anterior margin with a few others lower down on the sides; transverse furrows distinct; lateral lobes about twice as long as high, the lower margin straight and horizontal; humeral sinus scarcely indicated; prosternum with a pair of triangular lobes; mesosternal lobes short, triangular, those of the metasternum rounded, not at all prolonged, scarcely developed; metasternum very noticeably narrowed posteriorly and the pits merged into one hole the sides of which are separated from the lateral margins of the sternum by a distance decidedly less than width of the hole. Legs long and slender; fore and middle tibiæ sulcate and unarmed above, below armed with several spines on both margins, foramina of anterior tibiæ shell-shaped, moderately expanded; posterior tibiæ armed above and beneath on both margins, an apical spine above on both margins; femora long and

slender; anterior femora nearly twice as long as the pronotum and, like also the middle ones, unarmed above and armed below on the cephalic margin only with three or four stout spines; hind femora about three times as long as the pronotum, moderately swollen in the basal three-fourths, unarmed above and armed beneath on the apical three-fourths on the cephalic margin with seven or eight stout spines, those toward the apex larger and apically bent moderately backward; all geniculations distinctly spined except the cephalic ones of the intermediate femora, which are rounded. Organs of flight fully developed; tegmina narrow with the margins about parallel, over four times as long as broad, apically very roundly subtruncate posteriorly; speculi small, membranous on the right tegmen and coriaceous on the left, the stridulating vein moderately thick, forming a very distinct rounded projection beyond the inner margin of the tegmen; wings broad and lightly fuliginous, the veins yellowish and the crossveins dark. Abdomen long and slightly compressed, the last dorsal segment broad and apically broadly concave; supraanal plate very roundly triangular, strongly declivate, sulcate dorsally; subgenital plate very elongate, longer than the pronotum, apically forming a mesially constricted shaft with the apex deeply divided, each branch a long sinuate flattened filament as long as the plate itself; these filaments, or flagellate processes, are evidently modified anal styles but they are not distinctly articulated, appearing to be prolongations of the apical forks of the subgenital plate and differentiated from the rest only by a darker color, as shown in Plate II, figure 17; cerci about five times as long as broad, cylindrical, gently tapered to a broadly rounded apex, curved moderately inward apically and furnished with a small chitinized subapical tooth, or tubercle, in the inner side.

Color uniformly yellowish brown with the last abdominal segment wholly piceous; the spines of the legs are blackish apically and those of the femora and of the ventral side of the hind tibiæ are blackish on the side toward the base of the leg; many of the crossveins of the tegmina are narrowly margined with black.

(♀). Essentially similar to the male in color and structure except that the cephalic geniculations of the intermediate femora are about as sharply spined as the caudal ones and the penultimate segment of the abdomen is laterally piceous. The ovipositor is long and heavy, over twice as long as the pronotum, the lower margin gently curved upward, and finely serrated for two-thirds of the length, the upper margin nearly straight only apically serrate and these scarcely discernibly so. The ovipositor is blackish in the apical half, especially the margins. Cerci simple, rounded, tapering in the apical fourth to a point. Subgenital plate subtriangular, a little longer than broad, the apex broadly rounded and entire. Supraanal plate blackish, triangular, and broadly sulcate dorsally.

Measurements.—Length: pronotum, ♂, 6 mm., ♀, 6.5 mm.; anterior femora, ♂, 11 mm., ♀, 12 mm.; posterior femora, ♂, 20 mm., ♀, 22 mm.; tegmina, ♂, 30 mm., ♀, 33 mm.; subgenital plate, ♂, including apical flanges, 10 mm., ♀, 3 mm.; cerci, ♂, 5 mm., ♀, 4 mm.; ovipositor, 18 mm. Width: pronotum posteriorly, ♂, 4 mm., ♀, 4.5 mm.; tegmina at middle, ♂, 7 mm., ♀, 8 mm.; posterior femora at widest point, ♂, 2.50 mm., ♀, 2.75 mm.; ovipositor at middle, 3 mm.

Described from one ♂ and one ♀. Type, ♂, January 12, 1906. Iconnicoff. Allotype, ♀, same date as the type.

Type and allotype in the collection of the U. S. National Museum.

Cat. No. 21334, U. S. Nat. Mus.

Arrhenotettix, new genus.

This is a member of Brunner's group *Cocconoti* and in his keys runs out to *Homalaspis*, from which it differs by having the genicular lobes of the anterior femora unarmed, by having the basal segment of the antenna apically tuberculate, by the shorter and broader ovipositor and in the armature of the legs, that of the ventral surface of the posterior femora of the male being very remarkable.

Description.—Head about as broad as the anterior part of the pronotum; face strongly retreating; fastigium of the vertex not attaining the tip of the antennal scrobæ, elongate-triangular,

dorsally sulcate and without distinct basal tubercles; eyes prominent; basal segment of the antennæ furnished apically on the inner side with a prominent acutely conical tubercle. Pronotum smooth, the disk rounded into the sides without a sign of lateral carinæ, the anterior and posterior margins broadly rounded; transverse sulci moderately developed; lateral lobes slightly developed, more than twice as long as high, the lower margins horizontal and a little turned outward; humeral sinus none; prosternum unarmed; meso- and metasternal lobes not prolonged, rounded, the pits of the metasternum merged into one almost circular hole. Tegmina short, a little more than twice as long as the pronotum, the tympanum of the male well developed but not very large, projecting somewhat beyond the inner margin of the tegmina, the stridulating vein stout and projected a little farther than the speculum as a rounded lobe similar to the type figured under the following genus (Pl. II, fig. 19); wings broad and slightly fuliginous, when closed just reaching the tips of the tegmina. Legs moderately slender, the anterior femora but little longer than the pronotum; all femora unarmed above, beneath armed with one to three spines on the cephalic margin only in the fore and middle legs and four on the posterior ones, the last two of which are much larger than the basal two, in the male the penultimate one being of unusual length, almost twice as long as the femoral depth at the point of attachment (Pl. II, fig. 18); genicular arcs of the posterior femora and the caudal one of the intermediate femora spined, the others rounded; all tibiæ armed beneath on both margins with several spines; anterior tibiæ flat and unarmed above, the foramina shell-shaped, moderately expanded; middle tibia armed above on the caudal margin only with several small spines; posterior tibiæ armed above on both margins for nearly the entire length, an apical spine on the caudal margin only. Abdomen plump and slightly compressed; subgenital plate of both sexes moderately narrowed apically and broadly notched, in the male each side bearing a cylindrical pointed style five or six times as long as broad; supraanal plate irregular, dorsally dimpled, or longitudinally sulcate; cerci of male stout, cylindrical, about twice as long as broad, apically broadly rounded

and with a small inner subapical tooth; ovipositor stout, about one and one-half times as long as the pronotum and moderately curved upward, apically very minutely serrate on each margin.

Type, *Arrhenotettix calcaratus*, new species.

Arrhenotettix calcaratus, new species. (Pl. II, fig. 18.)

Description (♂).—Structural characters as given in the generic description. General color reddish brown, the elytra with a more yellowish cast; spines of the legs with the extreme tips blackish; tympanum of the male with the speculum transparent on the right tegmen and coriaceous on the left.

(♀). Scarcely differing from the male except as noted in the generic description. The ovipositor is slightly darker in the apical half, especially along the margins.

Measurements.—Length: pronotum, ♂, ♀, 5.5 mm.; anterior femora, ♂, ♀, 7.5 mm.; posterior femora, ♂, 18 mm., ♀, 17 mm.; tegmina, ♂, 15 mm., ♀, 15.5 mm.; penultimate ventral spine of the posterior femora, ♂, 4 mm., ♀, 1.25 mm.; ovipositor, 10 mm. Width: pronotum posteriorly, ♂, ♀, 3.25 mm.; tegmina mesially, ♂, 4 mm., ♀, 3.75 mm.; posterior femora at widest point, ♂, 4.5 mm.; ♀, 4 mm.; at base of penultimate ventral spine, ♂, 2 mm., ♀, 1.5 mm.; ovipositor at middle, 2.25 mm.

Described from two ♂♂ and one ♀. Type, ♂, November 25, 1906, Iconnicoff. Allotype, ♀, December 3, 1906, Iconnicoff. Paratype, ♂, December 6, 1906, Iconnicoff.

Type and allotype in the collection of the U. S. National Museum; paratype in the collection of Iconnicoff.

Cat. No. 21335, U. S. Nat. Mus.

The cerci of the paratype are truncate apically instead of rounded, but this is obviously due to shrinkage in drying.

Hoplotettix, new genus.

This is apparently most nearly allied to *Nannotettix* but the armed basal segment of the antennæ and spined geniculations of the femora will serve to separate it readily from that genus.

Description.—Head of moderate size, no broader than the pronotum; fastigium of the vertex elongate triangular, twice as long as broad, apically pointed, dorsally sulcate, not quite

reaching the tips of the antennal scrobæ and with a pair of moderately elevated basal tubercles; eyes round and prominent; basal segment of the antennæ armed apically on the inner side with a stout spine. Pronotum rugose with a scattering of little-elevated rounded tubercles, the disk rounded into the lateral lobes without lateral carinæ except dull ones on the posterior three-fourths of the metazona; the pronotal disk is subtruncate posteriorly, the disk there flattened and with a short slight median carina, and very broadly and roundly angulate anteriorly and usually with a slight mesial swelling on the front margin; transverse sulci well developed, the posterior one very distinct; lateral lobes shallow, about twice as long as high and without humeral sinus, the lower margin thickened and straight, gently slanting upward from in front backward; prosternum with a pair of moderately long spines; meso- and metasternal lobes acutangulate, the latter more rounded; metasternal pits merged to form a single rounded opening. Organs of flight strongly abbreviated, the elytra scarcely twice as long as the pronotum and the wings scarcely longer. Legs long and slender, the anterior femora nearly twice as long as the pronotum; anterior tibiæ flat and unarmed above, beneath armed on both sides with several spines; foramina conchate, little expanded; middle tibiæ unarmed above on the cephalic margin, the opposite margin armed with from one to three short spines and armed beneath on both sides with several spines; posterior tibiæ armed above and below on both margins for most the length, an apical spine above on both sides; all femora unarmed above but with all the geniculations spined; anterior and intermediate femora unarmed beneath on the caudal margin, the opposite side with one or two spines; posterior femora armed beneath on the outer, or cephalic, margin only with six to eight spines in the apical two-thirds. Abdomen stout, subcompressed; subgenital plate of the male apically narrowed, deeply cleft, the side pieces cylindrical, about twice as long as broad and terminated by a pair of cylindrical blunt styles about four times as long as broad, of the female apically narrowed and with a V-shaped notch; supraanal plate of both sexes about as long as broad, apically broadly rounded, more so in the male,

where it is turned down to a vertical position; cerci of male cylindrical, simple, about four times as long as broad, apically suddenly constricted to a sharp naked inwardly directed spine; ovipositor short and stout, moderately curved upward and gradually tapered to a sharp point, the whole about twice as long as the pronotum and unarmed above and below, the ventral margin apically very minutely undulate.

Type, *Hoplotettix iconnicoffi*, new species.

Hoplotettix iconnicoffi, new species. (Pl. II, fig. 19.)

Description (♂, ♀).—Characters mostly stated in the generic description. General color dark brown, the legs, antennæ, and ovipositor somewhat lighter; the whole insect is sprinkled with inconspicuous yellowish dots, that being the color of the thoracic tubercles; the cerci and subgenital styles of the male light brown; wings moderately fuliginous, much shorter than the elytra but fully as broad; tympanum of right tegmen of the male with transparent speculum, that of the left one opaque, both of moderate size and projecting beyond the inner margin of the tegmen, the stridulating vein stout and forming a rounded angle with a triangular notch just beyond it, as common in this type of insect and described in other words under the genus *Arrhenotettix* and figured here. (Pl. II, fig. 19.)

Measurements.—Length: pronotum, ♂, 5.5 mm., ♀, 6 mm.; anterior femora, ♂, 10 mm., ♀, 11 mm.; posterior femora, ♂, ♀, 20 mm.; tegmina, ♂, 10 mm., ♀, 11 mm.; ovipositor, 12 mm. Width: pronotum posteriorly, ♂, ♀, 3 mm.; tegmina mesially, ♂, 3.5 mm., ♀, 4 mm.; posterior femora at widest point, ♂, 3.75 mm., ♀, 4 mm.; ovipositor at the base, 3 mm., mesially, 2 mm.

Described from three ♂♂ and one ♀. Type, ♂, November 29, 1906, Iconnicoff. Allotype, ♀, December 1, 1906, Iconnicoff. Paratypes a and b, November 13 and December 15, 1906, Iconnicoff.

Type and allotype in the collection of the U. S. National Museum; paratypes in the collection of Iconnicoff.

Cat. No. 21336, U. S. Nat. Mus.

The paratypes are of about equal size and average slightly

smaller than the type. Otherwise they offer no variation from the type.

***Diophanes salvifolia* Lichtenstein.**

Locusta salvifolia Lichtenstein, Cat. Mus. Hamburg, vol. iii, p. 82 (1796); *Diophanes salvifolia* Kirby, Syn. Cat. Orth., vol. ii, p. 345 (1906).

Two ♀ ♀, January and February, 1909. Schunke.

***Typophyllum undulatum*, new species. (Pl. IV, fig. 20.)**

This is an inconspicuous form in some respects allied to the species of the genus *Mimetica*, especially in the posteriorly notched pronotal disk.

Description (♀, the ♂ unknown).—Head roughened by small granular tubercles; face flat, the scutellum narrowed above and disappearing between the oppressed apices of the moderately developed and somewhat elevated antennal scrobæ; fastigium of the vertex small and triangular, dorsally sulcate, slightly elevated and fitted closely between the antennal scrobæ and not nearly attaining their tips; eyes slightly irregularly rounded and very moderately prominent, behind each a slightly elevated colored line representing lateral carinæ continuous with those of the pronotum; antennæ with the basal segment large, flat above, the second segment considerably smaller and somewhat shorter, the succeeding ones cylindrical, the joints not very conspicuous. Pronotum slightly concave dorsally, the disk slightly narrower anteriorly than posteriorly, the anterior margin slightly and broadly concave, the posterior margin very broadly angulate and with a small mesial notch; lateral carinæ sharp and straight, somewhat roughened by tubercles; lateral lobes nearly quadrate, the lower and anterior margins broadly rounded, the former nearly horizontal, the hind margin straight to the deep but obtuse sinus; prosternum unarmed, meso- and metasterni armed with a pair of short acute spines, the pits merged. Organs of flight fully developed; tegmina shaped as shown in Plate II, figure 20, and very closely resembling a leaf, there being even a transparent fungus-like spot in the middle of the posterior field; wings very broad apically and rounded, the costal margin considerably curved upward;

posterior radial vein stout; ulnar vein branching at about the middle; legs stout and lobately armed; anterior tibiæ wholly unarmed, the foramina conchate, little expanded and not extending above the dorsal surface of the tibiæ; middle and hind tibiæ unarmed beneath, above furnished with a few apically rounded flattened projections on each margin, the posterior ones with a broad one near the base, no apical spines but with a single pair of ventral calcars, short and stout; the middle tibiæ are very much broadened in the basal two-thirds; anterior and intermediate femora compressed, about four times as long as broad, unarmed above, beneath armed on the cephalic margin with four very broad, flat, triangular teeth and on the opposite margin with one or two small tubercles; posterior femora not strongly swollen basally, unarmed above, beneath on the cephalic margin with three large flat triangular spines in the distal half and with five or six small ones on the proximal half, the opposite carinæ with five or six very small sharp spines in the apical two-thirds, the basal ones very short, mere tubercles in fact; all geniculations unarmed. Abdomen flattened, the 2, 3 and 7 segments dorsally somewhat lammellately compressed and slightly prolonged posteriorly; supraanal plate slightly broader than long, dorsally roundly convex and apically broadly rounded; subgenital plate a little broader than long, posteriorly narrowed and apically with a broad mesial notch; cerci simple, no more than twice as long as broad, suddenly constricted mesially to less than half the basal width; ovipositor one and one-half times as long as the pronotum, curved strongly upward in the basal third and apically gently enlarged, the upper margin bluntly serrate in a little more than the apical half, the serration of the apical fourth or fifth larger and forming a double row; the lower margin is tuberculously serrate in the apical half, the teeth larger apically and covering also the lateral surfaces of the lower valves.

Measurements.—Length: pronotum, 6 mm.; anterior femora, 6 mm.; posterior femora, 16 mm.; tegmina, 35 mm.; wings, 25 mm.; ovipositor, 9.5 mm. Width: pronotum poste-

riorly, 5 mm.; tegmina mesially, 17 mm.; posterior femora at widest point, 2.5 mm.; ovipositor mesially, 1 mm.

Described from one ♀, the type, September, 1908. Schunke.

Type in the collection of the U. S. National Museum.

Cat. No. 21337, U. S. Nat. Mus.

***Chlorophylla rufipes* Brunner.**

Chlorophylla rufipes Brunner, Monogr. Pseudoph., p. 266, pl. x, fig. 116 (1895); Kirby, Syn. Cat. Orth., vol. ii, p. 353 (1906).

Two ♀ ♀, November, 1908, and October, 1909. Schunke.

Subfamily MECOPODINÆ

***Rhammatopoda opilionoides* Redtenbacher.**

Rhammatopoda opilionoides Redtenbacher, Verhandl. zool.-bot. Ges. Wien, vol. xlii, p. 203, pl. iii, fig. 6 (1892); Kirby, Syn. Cat. Orth., vol. ii, p. 360 (1906).

Rhammatopoda redtenbacheri Bolivar, Ann. Mus. Nat. Hung., p. 169 (1903).

Two ♂ ♂, two ♀ ♀, November 2, 9, 16, and December 12, 1916. Iconnicoff.

Tabaria opilionoides Walker, the type of which was examined by the writer in 1913, is amply distinct from the above species both generically and specifically. Thus the substitution by Bolivar of the specific name *redtenbacheri* for Redtenbacher's species is unwarranted and this name accordingly falls in the synonymy.

Subfamily PHANEROPTERINÆ

***Dysonia elegans* Brunner.**

Aphidnia elegans Brunner, Monogr. Phaneropt., p. 155 (1878);

Dysonia elegans Kirby, Syn. Cat. Orth., vol. ii, p. 411 (1906).

One ♀, November, 1908. Schunke.

***Dysonia punctifrons* Brunner.**

Aphidnia punctifrons Brunner, Monogr. Phaneropt., p. 154 (pl. iii, fig. 40a, b (1878); *Dysonia punctifrons* Kirby, Syn. Cat. Orth., vol. ii, p. 412 (1906).

One adult ♀, no date, one immature ♂, May 3, 1908. Schunke.

Insara peruviana Brunner.

Hormilia peruviana Brunner, Verhandl. zool.-bot. Ges. Wien, vol. xli, p. 117 (1891); *Insara peruviana* Kirby, Syn. Cat. Orth., vol. ii, p. 443 (1906).

One ♂, no date, one ♀, September 7, 1906. Iconnicoff.

Ceraia dentata Brunner.

Scudderia dentata Brunner, Monogr. Phaneropt., p. 243 (1878);
Ceraia dentata Kirby, Syn. Cat. Orth., vol. ii, p. 451 (1906).

Three ♂♂, three ♀♀, October 16, 1906, Iconnicoff, and October, November and December, 1908, Schunke.

The female of this species, which I believe has never been described, shows no characters differing essentially from those of the male. The ovipositor is nearly twice as long as the pronotum and apically rounded and dentate. The measurements of this sex are as follows:

Length: pronotum, 5.5 to 6 mm.; tegmina, 38 to 40 mm.; posterior femora, 26 to 28 mm.; ovipositor, 10 to 11 mm. Width: tegmina at widest part, 8 mm.; ovipositor mesially, 2 mm.

The color of this species as represented by the six specimens here recorded varies from decidedly greenish to reddish brown, the latter very likely due, at least in part, to changes after death. There are a few obscure dots along the middle of the tegmina of all the specimens, noticeable only under a glass.

Plagiopleura gracilis Brunner.

Euthyrrhachis gracilis Brunner, Monogr. Phaneropt., p. 331, pl. vii, fig. 96 (1878); *Plagiopleura gracilis* Brunner, Verhandl. zool.-bot. Ges. Wien, vol. xli, p. 132 (1891); *Euthyrrhachis gracilis* Kirby, Syn. Cat. Orth., vol. ii, p. 452 (1906).

One ♀, no date. Schunke.

There seems little question as to the synonymy of the genus *Euthyrrhachis* with *Plagiopleura* and Kirby's use of it as a distinct genus appeared indefensible. Brunner himself very clearly states that it is to be dropped (Verh. zool.-bot. Ges. Wien, vol. xli, p. 177 (1891)), though his statement there that the only species is a *Parableta* is an error, what he intended to write being really *Plagiopleura* instead of *Parableta*, as shown

by his reference of it to the former genus on page 132 of the same work.

Scaphura nitida Perty.

Scaphura nitida Perty, Del. Anim. Art., p. 121, pl. xxiii, fig. 12 (1834); Kirby, Syn. Cat. Orth., vol. ii, p. 453 (1906).

Aganacris micans Walker, Cat. Derm. Salt. Brit. Mus., vol. v, Suppl., p. 41 (1871).

One ♀, August, 1908. Schunke.

Walker's *Aganacris micans* is here placed in synonymy under *Scaphura nitida* Perty. Walker's type was examined in 1913 and notes made at the time indicate this synonymy.

Scaphura sp.

One ♂, August, 1908. Schunke.

This specimen, which lacks antennæ, may be a variety of some of the several forms now listed under the name *vigorsi* Kirby or *nigra* Thunberg. It is very like the specimen figured by Perty as *Scaphura ferruginea* except there is a fuliginous area in the posterior apical field of the wings, narrowly continued along the anal margin more than halfway to the base.

Stilpnochlora incisa Brunner.

Stilpnochlora incisum Brunner, Monogr. Phaneropt., p. 361 (1878); *Microcentrum incisum* Kirby, Syn. Cat. Orth., vol. ii, p. 456 (1906).

Five ♀ ♀, October, 1908, January and May 11, 1909. Schunke.

Peucestes striolatus Brunner.

Peucestes striolatus Brunner, Monogr. Phaneropt., p. 366 (1878); Kirby, Syn. Cat. Orth., vol. ii, p. 458 (1906).

Four ♀ ♀, October and November, 1908, April and August, 1909. Schunke.

These specimens agree with Brunner's diagnosis except that there is barely a trace of transverse fuscous lines on the tegmina, in which respect they agree with the figure by Stoll, Repr., etc., pl. IVa, fig. 12 (1813), which Saussure and Zehntner, Biol. Cent. Amer., Orth., vol. i, p. 372 (1898), refers to this species.

Posidippus irregulariterdentatus Brunner.

Posidippus irregulariterdentatus Brunner, Verh. zool.-bot. Ges. Wien, vol. xli, p. 186 (1891); Kirby, Syn. Cat. Orth., vol ii, p. 459 (1906).

One ♀, Iquitos, Peru, February, 1907. Iconnicoff.

This specimen agrees very well with the description of the male except that it is a little larger, as might be expected, and the intermediate tibiæ are armed dorsally on the caudal margin only.

Posidippus fastigosus Brunner.

Posidippus fastigosus Brunner, Monogr. Phaneropt., p. 370 (1878); Kirby, Syn. Cat. Orth., vol. ii, p. 459 (1906).

One ♀, March, 1909. Schunke.

Anaulacomera apicidentata, new species. (Pl. II, fig. 21.)

An inconspicuous green species apparently most nearly allied to *A. dentata*, to which species it runs out in Brunner's key. The cerci of the male, however, seem to distinguish the two species, the inner tooth in *dentata* being mesial while in the species here described it is apical.

Description (♂).—Fastigium of the vertex sulcate dorsally, constricted mesially and apically a little elevated, meeting somewhat broadly the roundly pointed facial fastigium; front rounded, not laterally carinate, barely dimpled laterally. Pronotal disk flat but the lateral carinæ broadly rounded, the lateral lobes about equally high as long. Tegmina and wings presenting no peculiarities. Anterior and intermediate tibiæ rounded above and armed only with a small apical spine on the caudal margin, the intermediate one with a second very minute one near the base on the right leg only. Last dorsal segment of the abdomen roundly concave apically; supraanal plate rounded triangular; cerci short and stout, about six times as long as basally wide, cylindrical, curved gently inward and armed near the tip on the inner side with a blunt triangular tooth, as shown at figure 21.

(♀). Resembling the male. The ovipositor is uniformly curved upward and tapers in the apical fourth to a point, the basal three-fourths uniform in width, the margins of the apical

half very finely serrate. The armature of the legs is as in the male except there is no basal spine on either of the intermediate tibiæ.

Measurements.—Length: pronotum, ♂, ♀, 4 mm.; tegmina, ♂, 25 mm., ♀, 26 mm.; posterior femora, ♂, 18 mm., ♀, 15.5 mm.; cerci, ♂, 2 mm., ♀, 1.5 mm.; ovipositor, 8 mm. Width: tegmina at middle, ♂, 4.5 mm., ♀, 5 mm.; ovipositor mesially, 1.5 mm.

Described from two specimens: type ♂, September 11, 1906; allotype ♀, November 3, 1906. Both by Iconnicoff.

Type and allotype in the collection of the U. S. National Museum.

Cat. No. 21338, U. S. Nat. Mus.

Anaulacomera diluta Brunner.

Anaulacomera diluta Brunner, Verh. zool.-bot. Ges. Wien, vol. xli, p. 145 (1891); Kirby, Syn. Cat. Orth., vol. ii, p. 466 (1906).

One ♀, July 9, 1906. Iconnicoff.

This specimen has an apical spine on the caudal margin of the anterior and intermediate tibiæ and the latter have also three or four additional ones on the same margin.

Anaulacomera cercalis, new species. (Pl. II, fig. 22.)

This inconspicuous green species is allied to *sulcata* and *securifera* but the cerci of the male differ decidedly from those of either of these.

Description (♂).—Head as described above under *apicidentata*. The legs are also much as in *apicidentata*, even as to the second dorsal spine of the intermediate tibiæ being absent on one leg. The last dorsal segment of the abdomen is broadly rounded apically, above broadly and shallowly concave; supra-anal plate triangular, the apex rounded; cerci long and conspicuously branched; the basal portion is slightly flattened in the inner side, the apical portion conspicuously so, this apically compressed portion furnished beneath with two broad dull deflexed teeth and a more apical one very short and blunt and turned outward; the tip of the cercus itself is flattened, broad and pointed; at the basal fourth on the inner side is a broad vertically flattened appendage one-half as long as the main

body of the cercus and directed at a right angle to the main body; this appendage expands somewhat apically and is dorso-apically deeply notched, forming a sort of open monkey-wrench appearance and bearing toward the base a tubercle; this remarkable cercus is hard to describe adequately and difficult to figure properly, though the general structure and appearances is shown with some accuracy at figure 22.

(♀). Very like the male. The ovipositor is decidedly longer than the pronotum, gently curving upward apically, widest in the apical fourth, sides smooth, the margins very finely serrate in the apical half, more distinctly so apically.

Measurements.—Length: pronotum, ♂, 3.5 mm., ♀, 4 mm.; tegmina, ♂, 25 mm., ♀, 28 mm.; posterior femora, ♂, 14 mm., ♀, 17 mm.; cerci, ♂, 4 mm.; ovipositor, 9 mm. Width: pronotum posteriorly, ♂, ♀, about 2.25 mm.; tegmina mesially, ♂, 4.75 mm., ♀, 5 mm.; ovipositor mesially, 1.75 mm.

Described from five specimens: type ♂, October 19, 1906, Iconnicoff; allotype ♀, November 8, 1906, Iconnicoff; paratypes a and b, ♂ ♂, September, 1908, and January, 1909, Schunke; paratype c, ♀, November 11, 1906, Iconnicoff.

Type, allotype, and paratype a in the collection of the U. S. National Museum; paratypes b and c in the collection of Iconnicoff.

Cat. No. 21339, U. S. Nat. Mus.

? **Anaulacomera harpago** Brunner.

Anaulacomera harpago Brunner, Monogr. Phaneropt., p. 284 (1878); Kirby, Syn. Cat. Orth., vol. ii, p. 468 (1906).

One ♀, October 3, 1906. Iconnicoff.

This single female is placed here with much doubt. It is smaller than might be expected for this species. The measurements are as follows: Length: pronotum, 3 mm.; tegmina, 18 mm.; posterior femora, 14.5 mm.; ovipositor, 6 mm.; width, pronotum posteriorly, 2 mm.; tegmina mesially, 3 mm.; ovipositor mesially, 1.5 mm.

Anaulacomera schunkei, new species.

Description (♂).—Essentially as in *cercialis* except the structure of the cerci and even here the structure is of the same gen-

eral type. The subbasal inwardly directed projection is relatively somewhat longer than in *cercialis* and considerably broader apically, but of a similar shape; apically the cercus is irregularly and considerably compressed, the tip divided into two parts, the lower one triangular basally and cylindrical toward the end, the apex rounded and ciliate, the whole directed inward; the upper branch is flattened vertically, not quite so long as the lower one and the tip pointed or narrowly rounded, the whole in nearly a line with the basal portion of the cercus; just basad of this apically broadened and forked portion of the cercus there are a couple of acute tubercles, one above and one beneath.

(♀). Similar to *cercialis* except the ovipositor is shorter and not broadened toward the middle.

Measurements.—Length: pronotum, ♂, ♀, 3.5 mm.; tegmina, ♂, ♀, 24 mm.; posterior femora, ♂, ♀, 15 mm.; cercus, ♂, 3.5 mm.; ovipositor, 1 mm. Width: tegmina mesially, ♂, ♀, 4.5 mm.; ovipositor mesially, 1.5 mm.

Described from eight specimens. Type ♂, allotype ♀, October, 1908, Schunke; paratypes a and b, ♂ ♂, August and September, 1908, c, d, e, and f, ♀ ♀, October, 1908, August, 1909, and two without dates, all by Schunke.

Type, allotype, and paratypes a and c in the collection of the U. S. National Museum; paratypes b, d, e, and f in the collection of Iconnicoff.

Cat. No. 21340, U. S. Nat. Mus.

Anaulacomera longicercata, new species.

Another species differentiated from its allies by the characters of the cerci of the male.

Description (♂).—In general appearance similar to the last. Head with the sides of the front longitudinally and broadly depressed, the margins somewhat abrupt, tending to make the front laterally carinate; fastigium of the vertex narrow, scarcely more than one-half as broad as one of the basal antennal segments, mesially constricted, the broader apex broadly rounded, the whole narrowly sulcate dorsally and beneath tapered and meeting the facial fastigium in a point. Pronotum

with the lateral lobes about as long as high and rounded into the disk without distinct lateral carinæ except on the metazona where they are more developed; humeral sinus very well developed. Anterior and intermediate tibiæ armed above with a small apical spine on the caudal margin only. The cerci are conspicuous in length, are curved moderately inward and considerably compressed, especially in the apical half; this apical compressed portion is deeply undulately dentate beneath to form three rounded lobes, the terminal one forming the tip of the cercus; at about the basal fifth of the cercus there are two heavy inwardly directed projections situated one above the other, the lower one rounded and apically sharp pointed, the upper one situated a little basad of the lower one and about twice as long and much depressed, the apex rounded; the dorsal surface of the main body of the cercus has a couple of slight undulations near the middle.

(♀). Similar to the male but the fastigium of the vertex is somewhat broader, being a little more than one-half as broad as one of the basal segments of the antenna. The ovipositor is a little longer than in the last species.

The color is a uniform dull green; the dorsal spines of the hind tibiæ are black in the male and reddish brown in the female and the tympani of the male have the heavy veins somewhat infuscated.

Measurements.—Length: pronotum, ♂, 3 mm., ♀, 4 mm.; tegmina, ♂, 23.5 mm., ♀, 27 mm.; posterior femora, ♂, 17 mm., ♀, 18 mm.; cerci, ♂, 5 mm.; ovipositor, 10 mm. Width: tegmina mesially, ♂, 4 mm., ♀, 5 mm.; ovipositor mesially, 2 mm.

Described from seven specimens: type ♂, allotype ♀, November, 1908; paratypes a and b, ♂♂, October, 1908, and May, 1909, and c, d, and e, ♀♀, November, 1908, and two without dates. All by Schunke.

Type, allotype, and paratypes a and d in the collection of the U. S. National Museum; paratypes b, c, and e in the collection of Iconnicoff.

Cat. No. 21341, U. S. Nat. Mus.

Anaulacomera simplex, new species. (Pl. II, fig. 23.)

This apparently undescribed form is most nearly allied to *A. erinifolia* Brunner but is separable at a glance from that species by the smaller size and by the absence of black maculation in the anterior tibiæ. It also shows close relationship to *A. boliviana* Brunner but its size and the more distinctly carinate front separates it from that Bolivian form.

Description (♂, the ♀ unknown).—Head with the sides of the front longitudinally and broadly depressed, the margins somewhat abrupt, tending to make the front laterally carinate; fastigium of the vertex very narrow, much less than half as wide as one of the basal segments of the antennæ, tapering to a narrow rounded tip, above distinctly but not deeply sulcate. Lateral lobes of the pronotum about as high as long and rounded into the disk without distinct lateral carinæ except on the metazona. Anterior and intermediate tibiæ with a small dorsal spine on the caudal margin and the intermediate ones with three additional ones. Abdomen with the last dorsal segment apically truncate; supraanal plate deflexed, apparently triangular; subgenital plate longer than broad, narrowing apically and with the tip notched, each angle prolonged as a very short unsegmented style; cerci short, simple, incurved, tapering gradually to a moderately sharp and somewhat abruptly curved point as shown in Plate II, figure 23.

Color yellowish green, the elytra with a few dusky spots and the entire insect, body, legs, and antennæ, sprinkled with reddish dots so small as to be scarcely visible to the unaided eye.

Measurements.—Length: pronotum, 4 mm.; tegmina, 25 mm.; posterior femora, 15 mm.; cerci, 2.5 mm.; width: tegmina mesially, 4 mm.

Described from one specimen, type ♂, no date. Schunke.

Type in the collection of the U. S. National Museum.

Cat. No. 21342, U. S. Nat. Mus.

Viadana rhombifolia Brunner.

Ctenophlebia rhombifolia Brunner, Verh. zool.-bot. Ges. Wien, vol. xli, p. 156 (1891); *Viadana rhombifolia* Kirby, Syn. Cat. Orth., vol. ii, p. 472 (1906).

Two ♂♂, three ♀♀; October 11 and November, 1908, and September, 1909. Schunke.

Viadana lobata Brunner.

Ctenophlebia lobata Brunner, Monogr. Phaneropt., p. 303 (1878);
Viadana lobata Kirby, Syn. Cat. Orth., vol. ii, p. 471 (1906).

One ♂, November 11, 1906. Iconnicoff. One ♀, November, 1908. Schunke.

The male shows no peculiarities and is of about the same size as the female.

Phylloptera famula Brunner.

Phylloptera famula Brunner, Monogr. Phaneropt., p. 313 (1878);
Kirby, Syn. Cat. Orth., vol. ii, p. 474 (1906).

One ♂, August, 1908. Iconnicoff.

? **Arota rosaura** Karsch.

Arota rosaura Karsch, Soc. Ent., p. 89 (1891); Kirby, Syn. Cat. Orth., vol. ii, p. 476 (1906).

Two ♀♀, October, 1908, and March, 1909. Schunke.

These specimens are a little smaller than the measurements given in the original description but otherwise they seem to fit the specifications of this species very well. The anterior and intermediate tibiæ are spined above on both margins, a character at variance with those attributed to the genus and one not mentioned in the original description of the species. However, until further information is available, it is deemed best to refer these specimens to this species. The specimen taken in 1908 is green in color, especially the elytra, while the other one is brownish, with greenish tinge.

Family GRYLLIDÆ

Subfamily GRYLLOTALPINÆ

Neocurtilla hexadactyla Perty.

Grylotalpa hexadactyla Perty, Del. Anim. Art., p. 119, pl. xxiii, fig. 9 (1832); *Neocurtilla hexadactyla* Kirby, Syn. Cat. Orth., vol. ii, p. 2 (1906).

One ♂, November 4, 1906. Iconnicoff.

The specimen is very small, the pronotum measuring but 7 mm. in length. The tegmina cover about one-half of the abdomen and the wings are barely caudate.

Subfamily GRYLLINÆ

? *Gryllus capitatus* Saussure.

Gryllus pusillus Burmeister, Handb. Ent., vol. ii, p. 733 (1838);

Kirby, Syn. Cat. Orth., vol. ii, p. 36 (1906).

One ♀, no date. Schunke.

This yellowish brown female cricket is determined as *capitatus* with considerable doubt. In its present state of chaos the genus *Gryllus* is unwieldy and the numerous species are for the most part almost inseparable.

This specimen has the tegmina, the legs, the sternum, and the apical half of the ovipositor yellowish brown, also the lower part of the head, including the mouth parts; the rest of the insect is black. The anterior tibiæ have foramina on both sides, that on the inner side distinct but less than half as large as that on the opposite side. The tegmina extend to the end of the abdomen and the wings are caudate. The ovipositor is less than one and one-half times as long as the posterior femora. The pronotum is distinctly broader than long and is distinctly rounded posteriorly. The measurements are as follows: Length: pronotum, 5 mm.; tegmina, 16 mm.; wings beyond the tip of the tegmina, 12 mm.; posterior femora, 14 mm.; ovipositor, 18 mm. Width: pronotum, 7 mm.

This species, as well as a number of others now standing in the lists as distinct forms, may eventually prove to be the same as *assimilis*, or of no more than varietal distinctness, as has already been recorded as true of this species by Rehn, 2 Rept. Estac. Centr. Agron., p. 219 (1909).

? *Gryllus peruviansis* Saussure.

Gryllus peruviansis Saussure, Miss. Mex., Orth., p. 406 (1874);

Kirby, Syn. Cat. Orth., vol. ii, p. 28 (1906).

One ♀ nymph, August 30, 1906. Iconnicoff.

Miogryllus pusillus Burmeister.

Gryllus pusillus Burmeister, Handb. Ent., vol. ii, p. 733 (1838);

Miogryllus pusillus Kirby, Syn. Cat. Orth., vol. ii, p. 38 (1906).

One ♂, September 8, 1906; one ♀, September 10, 1906. Iconnicoff.

Miogryllus convolutus Johansson.

Gryllus convolutus Johansson, Amoen. Acad., vol. vi, p. 399 (1763); *Miogryllus convolutus* Kirby, Syn. Cat. Orth., vol. ii, p. 39 (1906); Hebard, Journ. N. Y. Ent. Soc., vol. xxiii, p. 105 (1915).

Grylloides brevipennis Saussure, Miss. Mex., Orth., p. 418 (1874); *Miogryllus brevipennis* Kirby, Syn. Cat. Orth., vol. ii, p. 39 (1906); Hebard, Journ. N. Y. Ent. Soc., vol. xxiii, p. 105 (1915).

One ♀, September 10, 1906. Iconnicoff.

Subfamily OECANTHINÆ

Amusus kirschianus Saussure.

Amusus kirschianus Saussure, Mem. Soc. Genève, vol. xxv, p. 409 (1878); Kirby, Syn. Cat. Orth., vol. ii, p. 65 (1906).

Three adult ♀ ♀, two on November 14, 1906, and one on December 3, 1906; one ♀ nymph; November 16, 1906. All by Iconnicoff.

The above nymph may not belong here, the anterior and intermediate femora being black and with three distinct yellowish bands, the corresponding tibiæ similarly but less distinctly marked. The pronotum of this specimen is also marked with light yellowish mottlings, tending toward the *Amusus festæ* of Giglio-Tos. One of the adults recorded above also varies somewhat toward *festæ*, which may indeed be but a form of *kirschianus*.

Endacusta maculata, new species.

A conspicuously mottled species related to *aztecus* Saussure but differing in the smaller tegmina of the male and the larger size of both sexes.

Description (♂ and ♀).—A fairly robust species, densely pilose and with moderately long legs. Head short, vertical, the mouth ventral; palpi long, the apical segment much longer than either of the others and abruptly swollen in the apical fourth, the apex diagonally truncate; vertex very narrow, not more than one-half as broad as the basal segment of the antenna;

ocelli moderately large, the apical one situated on the anterior aspect of the vertex on the extreme upper edge, the basal ones separated from each other by a distance slightly less than the width of one of them; eyes moderate in size and prominence, ovate, narrowing much below. Pronotum slightly transverse, the disk marked by a central longitudinal depression which fails to reach the posterior margin and expands posteriorly to form an illy defined cross, or transverse furrow; lateral lobes rounded into the disk without indication of lateral carinæ, the lower margins ascending posteriorly and rounded. Abdomen plump and, like the pronotum, marked with black splashes on a yellowish background; cerci long, about as long as the entire body, basally heavy and beyond tapering to a fine filament; ovipositor a little flattened and very long, decidedly longer than the posterior femora. Organs of flight absent in the female, in the male represented by abbreviated tegmina which are uniformly dark brown in color, slightly longer than the pronotum and almost as broad as long, being nearly circular in shape and with the dorsal field completely occupied by the well developed tympanum; the diagonal veins are three or four in number, one or two more or less indistinct, and the speculum is divided by one or two obscure veins; the tegmina cover about one-half of the abdomen. Legs moderately long and slender, conspicuously banded with black and densely pilose; all the femora and the tibiæ of the anterior and intermediate legs unarmed except for the apical spines of the tibiæ; anterior tibiæ with a small oval foramin on the inner side only; posterior tibiæ armed above on the apical half with four pairs of long movable spines, the longest slightly longer than the tibial depths, and a few scattering teeth of small size; the apical calcars of the posterior tarsi are three on each side and very diverse in size, the three outer ones moderate in size; the middle one twice as long as the upper one, which is a little shorter than the lower one; the two upper calcars of the outer side are large, densely pilose, and one-half as long as the very elongated metatarsus, but the ventral spur is minute; posterior metatarsus armed above with a few small stout black-pointed teeth and apically on each side with a very long stout hairy calcar.

General color light brownish heavily mottled with black.

Measurements.—Length: total, exclusive of the cerci or ovipositor, ♂ and ♀, 21 mm.; pronotum, ♂ and ♀, 4 mm.; posterior femora, ♂, 17 mm., ♀, 21 mm.; tegmina, ♂, 6 mm.; ovipositor, 25 mm.

Described from eleven specimens; type ♂, November 12, 1906; allotype ♀, no date; paratypes a and b, adult ♂ ♂, November 12 and 13, 1906; paratypes, c, d, e, and f, adult ♀ ♀, November 11, 11, 12, and 13, 1906; paratypes g and h, immature ♀ ♀, November 12, 1906, and no date; paratype i, immature ♂, November 13, 1906. All by Iconnicoff.

Type, allotype and paratypes c, d, h, and i in the collection of Iconnicoff; paratypes a, b, e, f, and g in the collection of the U. S. National Museum.

Cat. No. 21343, U. S. Nat. Mus.

No material variation in structure or coloration seems to be represented by the above series of parotypic specimens.

Some species now classed in the genus *Endacusta* are very surely wrongly placed. Thus the *E. dispar* of Redtenbacher from the West Indies, having winged females, probably do not belong here.

Oecanthus peruvianus Walker.

Oecanthus peruvianus Walker, Cat. Derm. Salt. Brit. Mus., vol. i, p. 95 (1869); Kirby, Syn. Cat. Orth., vol. ii, p. 75 (1906).

One ♀, May, 1909. Schunke.

This specimen probably represents Walker's *peruvianus*, though the original description furnishes few clues for the correct placing of the species. This female is very slender and the color is greenish, except the tip of the ovipositor, which is black. The wings are caudate, extending about $3\frac{1}{2}$ mm. beyond the tegmina. The antennæ are without markings of any kind, the basal segment being concolorous beneath and without swellings. The measurements are as follows:

Length: entire from front of head to end of wings, 18.5 mm.; tegmina, 11 mm.; posterior femora, 8.5 mm.; ovipositor, 5 mm.

Subfamily TRIGONIDINÆ

Cyrtoxipha peruviana Saussure.

Cyrtoxipha peruviana Saussure, Miss. Mex., Orth., p. 378 (1874); Kirby, Syn. Cat. Orth., vol. ii, p. 83 (1906).

One ♂, September 10, 1906. Iconnicoff.

A brownish green specimen measuring as follows: Length: pronotum, 1 mm.; tegmina, 5.5 mm.; wings beyond the tegmina, 4 mm.; posterior femora, 5.5 mm. Width: tegmina, 2.25 mm.

The pronotum is distinctly transverse, much broader posteriorly than anteriorly and marked dorsally with a broad blackish stripe covering two-thirds or more of the width.

Cyrtoxipha gracilis Scudder.

Trigonidium gracile Scudder, Proc. Bost. Soc. Nat. Hist., vol. xii, p. 331 (1869); *Cyrtoxipha gracilis* Kirby, Syn. Cat. Orth., vol. ii, p. 83 (1906).

One ♂, January, 1907. Iconnicoff.

This species is readily distinguished from the above species by the much smaller size.

Subfamily ENEOPTERINÆ

Eneoptera surinamensis De Geer.

Gryllus surinamensis De Geer, Men. Ins., vol. iii, p. 519, pl. xliii, fig. 1 (1773); *Eneoptera surinamensis* Kirby, Syn. Cat. Orth., vol. ii, p. 90 (1906).

Five ♀ ♀, August 31 and September 11, 1906, Iconnicoff, and October, 1908, Schunke.

Aphonomorphus peruvianus Saussure.

Aphonus peruvianus Saussure, Miss. Mex., Orth., p. 511 (1874); *Aphonomorphus peruvianus* Kirby, Syn. Cat. Orth., vol. ii, p. 106 (1906).

One ♂, December 23, 1906. Iconnicoff.

The anterior tibiae have a well-developed conchate foramen on the inner side, the outer side without any. This conchate foramen is a very distinctive character.

Aphonomorphus telskii Saussure.

Aphonus telskii Saussure, Miss. Mex., Orth., p. 511 (1874);
Aphonomorphus telskii Kirby, Syn. Cat. Orth., vol. ii, p. 106
(1906).

One ♀, November 23, 1906. Iconnicoff.

The apical segment of the palpi is not flattened as in the other two species here listed and is also shorter, being scarcely longer than the apical width.

Aphonomorphus mutus Saussure.

Aphonus mutus Saussure, Miss. Mex., Orth., p. 510 (1874);
Aphonomorphus mutus Kirby, Syn. Cat. Orth., vol. ii, p. 106
(1906).

Ten ♂♂, two ♀♀; one ♀ by Schunke in September, 1908, and all the rest by Iconnicoff in 1906 on following dates; 2 ♂♂, November 12; 4 ♂, November 12; 1 ♂, November 14; 1 ♂ and 1 ♀, November 16; 1 ♂, December 1; 1 ♂, December 11.

This species is very closely allied to the *Platydyctylus fasciatus* of Scudder which has been referred to the genus *Encoptera* but which really belongs to *Aphonomorphus*. In the female type of *fasciatus*, however, the median ocellus is more than one-half as large as the others and is separated from them by a distance about equal to one-half its own width, while in *mutus*, as here determined, the median ocellus is about one-half as large as the others and separated from them by a distance equal to about its own width. The wings of *mutus* are slightly less caudate than in *fasciatus*, in *mutus* exceeding the tegmina by about 4 mm., while in *fasciatus* they exceed them by about 5 mm.

Parametrypa aculeata Saussure.

Parametrypus aculeatus Saussure, Mem. Soc. Genève, vol. xxv, p. 681 (1878); *Parametrypa aculeata* Kirby, Syn. Cat. Orth., vol. ii, p. 108 (1906).

One immature ♂, November 20, 1906. Iconnicoff.

Date of publication, March 5, 1918.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar and
Frederick Knab.

Subscriptions and matter for publication should be addressed to Harrison
G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the
manuscript.

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INSECUTOR INSCITIZÆ MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. VI

APRIL-JUNE, 1918

Nos. 4-6

Insecutor Inscitiae Menstruus

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THE MALE GENITALIA OF AEDES AS INDICATIVE OF NATURAL AFFINITIES

(*Diptera, Culicidae*)

By HARRISON G. DYAR

The genus *Aedes*, treated in the broad sense, shows interesting modifications in the male genitalic structures. These have been brought out in the main in the monograph of the mosquitoes of North America by Howard, Dyar and Knab, but certain details may be here revised. The present author is mainly responsible for the genitalic table there adopted, and the main divisions still seem to him sound. Certain details, however, were clearly given undue prominence.

As regards the development of the genus in America, two elements may be distinguished. The first, and far larger one, represents what we may call the native element. It presents a complete graduation in the evolution of the organs called by us harpagones, from the rudimentary condition of a seta on a prominence to the highest development into a long strap-shaped appendage. Accompanying this development is that of the lobes of the side piece. Originally without lobes, the basal lobe evolves first, beginning as a condensation of hairs, then the hairs elevated on a prominence, then differentiated by shortening or some becoming spines, the final result being a membranous clasping organ studded with short papillæ, bearing minute setæ. The outer lobe follows much the same course of evolution, but in only one species has it reached the final stage shown by the basal lobe.

As would naturally be expected, where the lobes of the side piece show the most specialization, the harpagones are

comparatively undeveloped; that is, the highest development of the lobes and harpagones is not shown in the same species. For example, in *canadensis* the lobes are highly developed, but the harpagones are of a comparatively simple type. Conversely, in *trichurus*, the lobes are simple and the harpagones highly modified. This is natural, since if one set of organs comes into prominence for a special use, in this case that of prehension, another set must remain comparatively in abeyance.

The clasp filament in these American *Aedes* does not come much into use and remains throughout unmodified and simple. The divisions, therefore, which we will recognize among these American forms are mainly those of progressive specialization along one general line and not dichotomous divisions.

The second element in our fauna is what may be called the foreign element. It comprises three species only, not closely related, but all agreeing in the total absence of the harpagones. These organs have not only been unelaborated, but they do not exist in a rudimentary state. The side piece shows the development of a basal lobe, but of an independent order, not homologous with the basal lobe mentioned above for the American forms. The development is not marked, however, for in these species specialization has primarily affected the clasp filament, which has been adopted as the principal organ of prehension. Use also has been made of modifications of the basal membrane, which is entirely unknown to the American forms. These three species, *cinereus* Meigen, *verans* Meigen and *argenteus* Poiret, as has long been known with the last and recently shown for the other two, all have a wide distribution outside of North America. The first two are of temperate distribution, the last of tropical distribution. The first two are presumably endemic with us, having an originally holarctic distribution; the latter has probably been spread by commerce within historic times. In the monograph we argue for the American origin of the yellow fever mosquito, but it must be admitted that the genitalia lend no support to this view. No

near relatives of *argenteus* occur in America, but there are plenty of them in the East Indian region.

The division into New World and Old World series is not shown in the larvæ, which retain a uniform type; only in the genitalia, which are obviously more plastic structures, indicating a more exact degree of relationship.

To return to the native fauna, in contradistinction to the above, the species do not exhibit a wide range. Some few may be found to be common to America and the north of Europe, although this has not been shown as yet in any case. Still, there are some suspicious approximations. But, in general, the species are local, sometimes unexpectedly so, as I found in the mountains of California and Washington.

Considering the North American species in detail, the following groups may be recognized:

Group I.—Harpago a stout seta arising from a conical base; side piece without lobes.

This comprises *walkeri*, *albonotata*, *aurcostriata*, *busckii* and *fulvithorax*, and probably also *septemstriatus* D. & K., *quadrivittatus* Coq., *sexlineata* Theob., *ioliota* D. & K., and *aurites* Theob., the males of which are unknown. All of these species have the claws of the female simple and correspond to the genus *Howardina* Theobald. It is, however, simply a section of *Aedes* in a primitive condition. All the known larvæ live in tree-holes or leaves of Bromeliaceæ.

Group II.—Harpago with a distinct stem, the seta forming a more or less filamentous appendage; side piece without lobes.

This comprises *mediovittata*, *thorntoni*, *podographicus*, *oswaldi* and *triseriatus* and probably also *knabi* Coq., *hortator* D. & K. and *leucomelas* Lutz, the males of which are unknown. The known larvæ live in tree-holes. Three subgroups appear. In *mediovittata* a very peculiar basal spine has been developed, inserted below the base of the side piece. A dichotomous line has plainly started here, but seems to have been carried no farther. The other species form a compact section with the characters of the group, except *triseriatus*, in which there is an indication of the formation of lobes on the side piece, by

a basal and median collection of hairs. No lobes are formed, nor is the location of the hair-tufts exactly that in which the lobes later appear. We have here simply an indication.

Group III.—Harpago well developed; side piece with a basal lobe, small, not prominent, with a collection of long hairs; no apical lobe.

This includes *varipalpus*, *atropalpus*, *epactius*, *fluvialis*, *niger*, *taeniorhynchus*, *epinolus*, *sollicitans*, *mitchellæ*, and *nigromaculis* and probably *zoösophus* D. & K. One of the species lives in tree-holes, three in rock-holes, three in salt tidal pools, and two in temporary ground puddles inland. In this series we have the advance from breeding in the restricted water in plant-tissues to the ground puddle, in which the species of the highest groups so much rejoice.

Group IV.—Harpago well developed, sometimes enormously; basal lobe varying from a conical elevation with coarse hairs to a flattened expanded membrane with short papillæ and fine setæ; apical lobe present, always conical, setose or bare.

This includes the remaining species of *Aëdes*, with the single exception of *canadensis*, whose males are known, and probably the rest as well, somewhat over 60 species. All live in temporary ground pools. Some of the species are of tropical distribution, but the majority are boreal, breeding in the water formed by the melting snow and having but a single annual generation, overwintering in the egg. One species is confined to salt tidal pools and one invades this domain, though breeding also in fresh water inland. The habit of being confined to tree-holes or rock-holes is wholly lost. Moreover, not only has this extension of breeding places been accomplished, but the primitive tropical distribution has been extended and even the arctic regions invaded.

Two subgroups appear, indicating an incipient dichotomy. Four species have altered the structure of the basal lobe, namely, *impiger*, *diantæus*, *pullatus*, and *aurifer*. The lobe is large and conical, the hairs reduced to two, which have become very stout and followed by a spine. Apparently this modification did not prove a very happy one, for, in *pullatus*, the

lobe is reduced to a small stem, bearing the two stout hairs, while, in *aurifer*, the structure is absent, hairs and all, there being no basal lobe in this species, though the spine persists.

Of the following North American species the male genitalia are unknown: *decticus* Howard, Dyar and Knab, *centrotus* Howard, Dyar and Knab, *cataphylla* Dyar, *fisheri* Dyar, *ventrotrittis* Dyar, *provocans* Walker, *acrophilus* Dyar, *niphadopsis* Dyar and Knab, *bracteatus* Coquillett,¹ *balteatus* Dyar and Knab,¹ *angustitrittatus* Dyar and Knab,¹ *obturbator* Dyar and Knab,¹ *condolescans* Dyar and Knab,¹ *nubilus* Theobald, *gonimus* Dyar and Knab, *aloponotum* Dyar, and the imperfectly identified names, *fulvus* Wiedemann, *testaceus* van der Wulp, *excrucians* Walker, *borealis* Ludlow, and *punctor* Kirby. I am afraid that *euchrus* Howard, Dyar and Knab is *vexans* in a dilapidated condition, the yellow color of the single specimen not being natural.

Group V.—Harpago well developed; both lobes consisting of flattened membranous papillose prominences with small setæ.

The group comprises one species, *canadensis*, the larvæ living in ground pools in forest, having more than one hatching in the year.

In comparison with the table based on adult coloration, no parallelism appears. The black-legged and ring-legged forms are developed in all the groups. This has served to completely conceal the species of Old World derivation, which are inextricably mixed up in the table. No one would ever suspect their relationship, which is so apparent in the genitalia.

TABLE OF NORTH AMERICAN AEDES BY THE MALE GENITALIA

1. Harpago developed, with filamentous seta and columnar base...	2
Harpago rudimentary, a stout seta from a conical base.....	46
Harpago absent	49

New World series

2. Side piece with an apical lobe.....	3
Side piece without an apical lobe.....	38

¹ Placed provisionally in the table, in parentheses.

Group V (*Culicada* Felt)

3. Apical lobe flattened, papillose-tubercular.....*canadensis* Theobald
 Apical lobe conical..... 4

Group IV (*Ochlerotatus* Arribáizaga)¹

4. Basal lobe bearing only two stout spines, or absent..... 35
 Basal lobe conical or expanded, setose..... 5
 5. Basal lobe more or less expanded and tubercular, short-haired,
 with or without an adjacent spine..... 6
 Basal lobe unmodified, uniformly long-haired..... 37
 6. Basal lobe expanded tubercular; two stout spines on the margin,
 at least one in the middle..... 7
 Basal lobe with a spine at the margin..... 8
 Basal lobe without stout spine, though the marginal hair may be
 somewhat enlarged 30
 7. Both spines on basal lobe well developed.....*currici* Coquillett
 Only the spine on middle of lobe distinct,
campestris Dyar and Knab
 8. Basal lobe expanded, elongate; one stout spine on the margin of
 the lobe, elevated from the base and free..... 9
 Basal lobe more or less expanded; one stout spine on the margin
 adjacent to the side piece, not separated from the setæ..... 15
 9. Basal lobe setose on two-thirds of inner margin..... 10
 Basal lobe setose only on the bulbous tip..... 11
 10. Basal lobe widened; stem of harpago very stout, sinuate; filament
 broadly fusiform.....*atlanticus* Dyar and Knab
 Basal lobe finger-shaped; stem of harpago ligulate; filament angu-
 larly widened at base.....*oligopistus* Dyar²

¹ *Heteronychia* Arribáizaga has precedence and is an *Aedes*; but I have not been able to recognize the type, *dolosa* Arrib., so do not know to which section *Heteronychia* should apply. Blanchard and others refer *dolosa* to the synonymy of *Culex quinquefasciatus* Say, a proceeding negatived by Arribáizaga's original description.

² *Aedes oligopistus*, new species.

Apical lobe of side piece finger-shaped, bare but for one rather stout seta at tip and another at the side; basal lobe produced into a finger-shaped process, reaching to three-fourths of the side piece, finely setose; a stout spine inserted at one side. Harpago with long, slender stem, reaching nearly to middle of side piece; filament long, angularly expanded at the base. Side piece, harpe and clasp filament normal; basal appendages small, each with three setae.

An adult male, taken by Mr. A. Busck, Trinidad, West Indies, June, 1905, has the dorsum of mesonotum broadly silvery nearly to the lateral margins. Legs black.

Type, male, No. 21550. U. S. Nat. Mus.

The specimen is recorded in the monograph (page 781) under *A. dupreei*, which it resembles in coloration.

11. Basal lobe broadly capitate with many setæ.....	13
Basal lobe narrowly capitate with few setæ.....	13
12. Stem of harpago short, filament longer than it.. <i>dupreci</i> Coquillett	
Stem of harpago long, filament shorter than it.. <i>serratus</i> Theobald	
13. Harpago long, sinuate; filament sickle-shaped,	
<i>tormentor</i> Dyar and Knab ¹	
Harpago moderate; filament calla-lily-shaped.....	14
14. Filament of harpago broadly oval with very short recurved tip,	
<i>pertinax</i> Grabham	
Filament of harpago narrowly oval with long recurved tip,	
<i>polyagrus</i> Dyar ²	
15. Filament of harpago with retrose spine..... <i>scapularis</i> Rondani,	
<i>infirmatus</i> Dyar and Knab, <i>euplocamus</i> Dyar and Knab, (<i>condolenscens</i> Dyar and Knab); <i>tortilis</i> Theobald, <i>plutocraticus</i> Dyar and Knab, (<i>balteatus</i> Dyar and Knab), (<i>bracteatus</i> Coquillett); <i>trivittatus</i> Coquillett, <i>cuneatus</i> Dyar and Knab, (<i>angustivittatus</i> Dyar and Knab), (<i>obturbator</i> Dyar and Knab).	
Filament of harpago not so modified.....	16
16. A tuft of similar spines accompanying the spine of basal lobe...	17
Spine of basal lobe without accompanying similar spines.....	23

¹ *Aëdes tormentor* Dyar and Knab.

Side piece long, slender; apical lobe prominent, narrowly conical, setose; basal lobe expanded, long, narrow, setose on the outer third; a single spine inserted at basal third. Harpago long, reaching to middle of side piece, slenderly columnar, flexuous; filament rather small, broadly sickle-shaped.

Bred specimens sent by Dr. W. V. King, collected at New Orleans, Louisiana, September 15, 1914.

² *Aëdes polyagrus*, new species.

Apical lobe of side piece conical, straight on inner side, sparsely setose; basal lobe elongate, with a capitate rounded setose tip, the basal part bare; a stout spine inserted at the middle of the margin. Harpago with long, slender stem, reaching nearly to middle of the side piece; filament elliptical, with long, recurved tip, the base rounded and projecting and marked with lines. Other structures normal; basal appendages short, each with five setæ.

Adult male, Taboga Island, Panama, July 1, 1907 (A. Busck). The specimen is denuded and moldy, no trace of the thoracic vestiture remaining. Probably there was a narrow median silvery stripe as in *pertinax*. Legs black.

Type, male, No. 21551, U. S. Nat. Mus.

The original larval skin was preserved by Mr. Busck, but the bottle was not examined at the time and has become dried out during the ten years that it was sitting on the shelf. Therefore some of the finer characters are lost. It falls in the table with *serratus*, rather than with *pertinax*, with which latter the genitalia would place it.

Air tube short, conical, hardly twice as long as wide; pecten of 11 evenly spaced teeth, followed by a 7-haired tuft well beyond the pecten. Lateral comb of the eighth segment of about 10 smooth thorn-shaped scales in a nearly straight row. Anal segment ringed by the plate. Anal gills apparently moderate. Head

17. Apical lobe almost bare, with few setæ,
squamiger Coquillett, *grossbecki* Dyar and Knab¹
 Apical lobe setose..... 18
18. Filament of harpago angularly expanded near base..... 19
 Filament of harpago fusiform, without expansion..... 21
19. Spine of basal lobe stout, exceeding the accompanying tuft..... 20
 This spine weak, not exceeding the tuft,
hirsuteron Theobald, *aestivalis* Dyar
20. Spine and tuft weak, indistinct.....*aldrichi* Dyar and Knab
 Spine and tuft strong.....*spencerii* Theobald, *idahoënsis* Theobald
21. Apical lobe with the setæ curved and more or less appressed.... 22
 Apical lobe with the setæ unmodified,
abserratus Felt and Young, *auroides* Felt
22. Side piece not modified at base.....*hexodontus* Dyar
 Base of side piece strongly chitinized, the tubercles forming transparent dots.....*aboriginis* Dyar
23. Apical lobe weakly and sparsely setose..... 24
 Apical lobe more strongly setose..... 25
24. Basal lobe conical with many fine setæ.....*prodotes* Dyar
 Basal lobe small with few coarse setæ..*lazarensis* Felt and Young
25. Filament of harpago with double angular basal membrane; spine of basal lobe situated distally....*tahoënsis* Dyar, *altiusculus* Dyar
 Not so formed..... 26
26. Filament of harpago sickle-shaped.....*cantator* Coquillett
 Filament of harpago expanded or notched..... 27
27. Basal lobe of side piece conical, concrete..... 28
 Basal lobe expanded, diffused outward..... 29
28. Filament of harpago large, triangularly expanded near base,
bimaculatus Coquillett
 Filament sickle-shaped, notched at base.....*fitchii* Felt
29. Harpago stout; filament angularly expanded near base,
fletcheri Coquillett
 Harpago slender; filament angularly expanded near middle,
stimulans Walker
30. Basal lobe flat..... 31
 Basal lobe conical, concrete..... 33
31. A long rugose-papillose area reaching up nearly to apical lobe,
abfitchii Felt and Young²
 Basal lobe tubercular and diffused, not forming a rugose area... 32

hairs lost in the finished mount, but one single one was observed during preparation.

¹ Doubtfully placed in the absence of a slide.

² *A. euedes* Howard, Dyar and Knab, is a synonym of *abfitchii*.

32. Filament of harpago angularly expanded at basal third,
sansoni Dyar and Knab
 Filament of harpago angularly expanded beyond middle,
increpitus Dyar
33. Basal lobe highly conical, setose on basal aspect; filament with a
 broad knife-blade expansion.....*riparius* Dyar and Knab
 Basal lobe low-conical, a stout seta on inner margin; filament
 small, sickle-shaped 34
34. Spines of basal appendages long.....*palustris* Dyar
 Spines of basal appendages moderate.....*mimesis* Dyar
35. Basal lobe large with two stout spines.....36
 Basal lobe small with two stout spines.....*pullatus* Coquillett
 Basal lobe absent; no basal spines.....*aurifer* Coquillett
36. A slight hairy area distal of apical lobe.....*impiger* Walker
 A strong hairy area proximal of apical lobe,
diantacus Howard, Dyar and Knab
37. Harpago rather long; filament sickle-shaped with double dorsal
 membranous ridge.....*innuitus* Dyar and Knab
 Harpago long, the filament bud-shaped.....*trichurus* Dyar
 Harpago short, branched; filament sack-shaped,
thibaulti Dyar and Knab
38. Basal lobe small with long setæ..... 39
 Basal lobe undeveloped..... 43

Group III (*Taeniorhynchus* Arribáizaga)

39. Filament of harpago with central retrose spine,
epinolus Dyar and Knab, *taeniorhynchus* Wiedemann, *niger* Giles
 Filament of harpago without such spine..... 40
40. Side piece short; basal lobe with a secondary area of short setæ
 beside it.....*varipalpus* Coquillett
 Side piece moderate; basal lobe small, unmodified..... 41
41. Harpago short, the filament longer than it..... 42
 Harpago longer, the filament shorter.....*nigromaculis* Ludlow
 Harpago distinctly long, the filament much shorter,
atropalpus Coquillett, *epactius* Dyar and Knab
42. Filament much longer than harpago.....*fluviatilis* Lutz
 Filament slightly longer than harpago,
sollicitans Walker, *mitchellæ* Dyar

Group II (*Gualteria* Lutz)

43. An articulated spine at base of side piece...*mediovittata* Coquillett
 Without this structure at base of side piece..... 44
44. A hair-tuft at middle of side piece.....*triseriatus* Say
 Without this structure..... 45

45. Harpago with very long subapical seta.....*oswaldi* Lutz
 Harpago with subapical seta minute,
thorntoni Dyar and Knab, *podographicus* Dyar and Knab

Group I (*Howardina* Theobald)

46. Basal appendages absent.....*walkeri* Theobald
 Basal appendages present..... 47
 47. Seta of harpago as long as its conical base..... 48
 This seta twice as long as its short base.....*fulvithorax* Lutz
 48. Clasp filament slender, longer than side piece,
albonotata Coquillett
 Clasp filament stouter, shorter than the side piece,
busckii Coquillett, *aureostriata* Grabham

Old World series

49. A modified structure representing the clasp filament, furcate at
 tip and with a projection at base.....*cinereus* Meigen
 Clasp filament normal or subnormal..... 50
 50. Clasp filament flattened, with claw inserted subapically,
vexans Meigen
 Clasp filament simple, normal.....*argenteus* Poiret

To turn now to the Old World forms. My knowledge of these is limited; but, fortunately, a valuable paper by F. W. Edwards¹ is available. Edwards accepts the wide interpretation of *Aedes* as proposed by Mr. Knab and myself; but he does not make the distinction between the New World and Old World types here suggested. This difference is certainly not obvious in the female adult, with which Mr. Edwards was largely dealing; but I am not entirely hopeless that some character may be found, now that attention has been directed to the matter.

Edwards uses genitalic and other adult characters, the genitalic being supplementary. His classification is as follows:

Genus *Aedes* Meigen.

Subgenus 1. *Armigres* Theobald.

Subgenus 2. *Stegomyia* Theobald.

Subgenus 3. *Ochlerotatus* Arribáizaga.

Group a. *Finlaya* Theobald.

Group b. *Diceromyia* Theobald.

¹ Bull. Ent. Research, vii, 201-229, 1917.

Group *c. Ochlerotatus* Arribálzaga.

Section 1. *Ochlerotatus* Arribálzaga.

Section 2. *Ecculex* Felt.

Section 3. *Ædimorphus* Theobald.

Subgenus 4. *Ædes* Meigen.

Subgenus 5. *Skusea* Theobald.

Taking the groups seriatim without regard to the rank assigned:

Armigeres Theobald. Edwards tabulates 13 species and figures the genitalia of 4. The harpes and unci are well developed, normal; no harpagones; a basal lobe is present, but I cannot tell whether it is a development of the side piece or the basal membrane. I think it is derived independently of the side piece as in the Old World type in general. The clasp filament has generally a whole row of teeth. This is clearly an Old World group.

Stegomyia Theobald. Five species are here referred to besides the well known *argenteus* Poiret, namely:

variegata Doleschal (= *scutellaris* Walker).

albopicta Skuse (= *scutellaris* Theobald, not Walker).

vittata Bigot (= *sugens* Theobald, not Wiedemann).

fraseri Edwards.

thomsoni Edwards.

Three of these are before me. Side piece without a basal lobe; harpes not especially modified; unci small; the basal membrane is simple or moderately modified; clasp filament generally simple, rarely expanded. This is clearly an Old World group.

Finlaya Theobald. Besides the European *geniculatus* Olivier, which represents the American *triseriatus* Say, Edwards lists the following:

eatoni Edwards.

pulchrienter Giles.

togoi Theobald.

longipalpis Grünberg.

flavipennis Giles.

melanopterus Theobald.

trilineatus Theobald.

niveus Ludlow.

greeni Theobald.

notoscriptus Skuse.

kochi Donovan.

oreophilus Edwards.

japonicus Theobald.

macfarlanei Edwards.

poicilia Theobald.

gubernatoris Giles.

lophoventralis Theobald.
albotaeniatus Theobald.
pseudotaeniatus Giles.

leucomeres Giles.
australiensis Theobald.

The description agrees with my Group II of the New World stock, and undoubtedly it is this as far as the European *geniculatus* is concerned. But I think there is some misapprehension or confusion here. The type of *Finlaya* is *poicilia*, the male unknown to me; but I think it is not allied to *geniculatus*. I have before me *Finlaya samoana* Grünberg, which proves to be structurally distinct from any New World type. There are no harpagones, but the harpes are drawn out in strap-shaped form with widened membranous tips, thus simulating the structure of the harpagones. If this is the case in the other species listed, we have in *Finlaya* an Old World group, from which *triseriatus* and *geniculatus* should be removed.

Diceromyia Theobald.¹ This includes only *furcifer* Edwards and *adersi* Edwards. The male genitalia are without harpagones and therefore this is an Old World group. I do not perceive any essential distinction from *Ecculx*, but I know neither of the species in nature.

Ochlerotatus Arribáizaga. Side piece of the genitalia with basal and apical lobes; harpagones well developed, the filament flattened. This corresponds to Group IV of the New World stock. The species are said to be dominant in North America, Europe and, curiously enough, in Australia. The statement is perfectly correct and I have before me an Australian species the genitalia of which have not been previously described.²

¹ Fourth Report, Wellcome Lab., 151, 1911.

² *Aedes labeculosus* Coquillett.

Culex labeculosus Coquillett, Ent. News., xvi, 116, 1905.

Ochlerotatus labeculosus Edwards, Ann. Mag. Nat. Hist., (8), ix, 522 and 524, 1912.

Genitalia.—Side piece over three times as long as wide, grooved within; apical lobe conical, oblique, setose, the setæ pointing toward the side piece; basal lobe rounded, prominent, with three short spines toward the dorsal aspect, the central one hooked, and fine setæ on the ventral side. Clasp filament slender, moderate, curved at tip, with a long terminal inserted spine and two setæ on the outer side before tip. Harpago moderate, slender, the terminal inserted filament longer than the stem, widely angularly expanded in the middle. Harpes conical, moderate, each with a pointed recurved tip. Unci large, columnar, basally situated, the slender tips pointed inward. Basal appendages moderate, with rather irregular tip and about four short setæ.

Edwards mentions two species as transitional to *Ecculex*, namely *annuliferus* Ludlow and *fryeri* Theobald. He says the basal lobes are developed into small harpagones, which have a short straight terminal spine. Without seeing specimens, no opinion can be rendered. I shall be surprised, however, if these species do not fit into place in the Old World series without any relation to *Ochlerotatus*.

Ecculex Felt. Founded on *texans* Meigen and including also a large number of allied species. This is a typical Old World group.

Aëdimorphus Theobald. Side piece without lobes; clasp filament various; harpagones absent. The species are unknown to me, but, on the definition, clearly an Old World group. Edwards states that it seems to merge on the one hand into *Ecculex* and on the other into *Stegomyia*. This I can readily believe.

Aedes Meigen. Twelve species are referred here, having short palpi in the male. Sketches are given of the genitalia; but Edwards does not attempt a definition on account of their diversity. After studying the remarkable development shown, I believe that the processes of the side piece do not represent the clasp filament, which is absent. The harpes are variously modified and the basal membrane as well. We have here a very distinct group of the Old World type. It is unfortunate that this aberrant group must give its name to the whole genus.

Skusea Theobald. Five species are mentioned, of which the genitalia are sketched. All the species are unknown to me. They seem peculiar and modified. Edwards describes them thus: "Male genitalia with five or six long processes which have apparently been derived from the basal lobes of the side piece, but in some cases have become nearly apical, resembling the somewhat similar structures of *Culex*." In the discussion, he speaks of an harpago, but it does not appear that that structure is really present. It is difficult to deal with these aberrant forms on second-hand information; but, as far as I can see, this is an Old World group.

Taking Edwards's data in conjunction with the few forms known to me, I would divide the Old World (*Aëdes*) stock as follows:

Group I.—Side piece without a basal lobe; harpes not especially modified; unci small (*Stegomyia*). A skeleton arrangement of the species might be as follows:

1. Clasp filament simple..... 2
 Clasp filament expanded at tip with the spine subterminal, long
 and curved *vittatus* Bigot
2. Basal membrane expanded into a false lobe..... 3
 Basal membrane not forming such a lobe,
 (*fraseri* Edwards), (*thomsoni* Edwards)
3. The false lobe free to the base,
 pseudoscuteilaris Theobald, (*variegata* Doleschall)
 False lobe attached to the side piece,
 albopicta Skuse, *argenteus* Poiret

Group II.—Side piece without a basal lobe; basal membrane modified, bearing five papillæ, which may pass up the lobe, becoming subapical; clasp filament various (*Skusea*).

I do not know this group at all, and my interpretation of Edwards's figures may not be correct.

Group III.—Side piece without a basal lobe; harpe strongly produced, ligulate, widened at tip and resembling an harpago; unci large.

I have only one species for this group. Edwards does not define it, although he must have observed it if, as I suppose, part of the species grouped under *Finlaya* belong here. A reëxamination of these species from the new point of view would be instructive.

***Aëdes samoana* Grünberg.**

Finlaya samoana Grünberg, Ent. Rundschau, xxx, 130, 1913.

Genitalia.—Side piece three times as long as wide, conical, without lobes; clasp filament apical, simple and rather short, with a long terminal spine, half as long as the filament; an area near base of side piece densely setose, followed by a row of very large scales crowded together. Unci large and prominent, conical, contracted centrally, the tips incurved. Harpes modified, a long ligulate curved stem, expanded in fan-shape

at the tip and radially marked, without any joint as occurs in the harpago at the insertion of the filament.

Group IV.—Side piece with a basal lobe, possibly as a development of the basal membrane; harpes and unci moderate; clasp filament generally with a long row of inserted spines (*Armigeres*).¹

Group V.—Side piece with a basal lobe, sometimes rudimentary, derived at the base of the side piece; clasp filament often modified; harpes and unci not strongly modified; harpagones absent (*Ecculcx*, *Aëdimorphus* and *Diceromyia*). A skeleton table of the species would run as follows:

1. Clasp filament inserted terminally..... 2
 Clasp filament inserted subapically.....*luteolateralis* Theobald
2. Filament entire, the spine subapical.....*vexans* Meigen,
 (*dentatus* Theobald), (*hirsutus* Theobald), (*cumminsi* Theobald)
 Clasp filament further modified..... 3
3. Filament simply cleft.....(*punctithorax* Theobald)
 Filament divided, one arm hooked and toothed,
 (*abnormalis* Theobald), (*alboventralis* Theobald)
 Filament expanded and lobed, with two terminal spines,
 (*minutus* Theobald), (*tarsalis* Newstead), (*irritans* Theobald)

Group VI.—Clasp filament apparently absent or at least modified out of all homology, inserted subapically, without terminal spine; basal lobe present (in *cinereus*); harpes and unci variously developed; basal membrane modified (*Aëdes*).

In *cinereus* Meigen the end of the side piece is rounded and blunt, and apparently this is the case also in *butleri* Theobald, *pseudomediofasciatus* Theobald and *fragilis* Leicester. The other species illustrated by Edwards have the side piece more or less hollowed at tip, the corners drawn inward into spines of various lengths. In *ceylonicus* Edwards the clasp filament is single and small; in *singularis* Leicester it is bent and forked; in *virilis* Leicester and *uncus* Theobald there are two long separated processes. Other modifications may be noted in Edwards's figures.

Certain improvements can be made to the table of genera of the tribe by genitalia, given by us in the monograph (vol.

¹ This probably represents a distinct genus, as with *Leicesteria* Theobald. See Edwards, Bull. Ent. Res., iv, 255-263, 1914.

rods, topped by a single piece. This has been called the uncus, which name we will retain. In the middle of the side piece is a slight lobe, bearing about five stout spines crowded together, situated at the apex of a basal hollow in which the uncus rests. In *Uranotania* the next step is seen. A second basal organ is present, paired and opposed to the unci, which have now lost the single terminal piece and appear as paired organs. The new organs have been called the harpes; but they are not homologous with those of *Culex* and others; *Uranotania* is clearly a side line. We mention the harpes here to show the early stage of a second basal organ. *Culiseta* is more directly in the line we are following. Here the unci form a basal cylinder or cone, composed of paired parts, but wrapped into a single organ by the revolute margins. True harpes are present in *Culiseta*, but they are more or less modified. A simpler condition is found in *Megarhinus*. Here the organs are elliptical, concave, more heavily chitinized on one side, the tip dentate. The side pieces have the basal area pouch-like, hollowed to receive the basal organs, the tip of the pouch forming a slight lobe with a group of three stout hairs. From this point *Orthopodomyia* and *Mansonia* originated; but they do not lie in the direct line of *Culex*, one being a generalized form parallel to *Culiseta*, the other an offshoot. *Climacura* falls here, the genitalia having the unci undivided. It is interesting, however, as the larva has become practically a true *Culex*. In *Culicella*, the unci have begun to divide, the harpes remaining as in *Culiseta*. The larvæ of *Culicella* have not attained the *Culex* type, but are still much as in *Culiseta*. The next link in the chain is shown in *Jamesia*, an Old World group in which the larvæ are predacious and, therefore, specially modified. The harpes have assumed the *Culex* type, with a crown of spines, and with this the genus *Culex* may be said properly to begin. *Lutzia* goes a step farther, the second plate of the unci being toothed, whereas it is perfectly simple in *Jamesia*. The side pieces have a process at the apex of the basal hollow, carrying three stout spines; the harpes have a crown of spines and a curved basal arm and the unci are divided into two plates.

The following tables separate first the genera of the tribe Culicini, then the subgenera of *Culex* and lastly the species of *Culex* as far as the American species are known to me in the male genitalia.

In the monograph¹ the parts called the "harpagones" (vol. iii, p. 224, dichotomy, 3 *et seq.*) are here identified as unci. I reserve the name harpagones for the structures so denominated in *Aedes*. I have omitted *dyari* and *melanurus*, commonly classed in *Culex*, as I have separated them generically under the headings *Culicella* and *Climacura* respectively.

It may be remarked that the tribe Sabethini are not distinguishable from the Culicini on genitalic characters (compare the monograph, vol. iii, p. 21, 1915). The lowest members, *Joblotia* and *Lesticocampa*, have genitalia essentially as in *Megarhinus* and *Orthopodomysia*, the unci only being somewhat modified. In the higher genera, the primitive condition of the basal parts remains; but the side pieces and clasp-filaments are greatly modified, the hollow basal lobes of the former having entirely disappeared. The two series are quite distinctly separated by their mode of evolution.

TABLE OF GENERA OF THE TRIBE CULICINI

- | | |
|---|-------------------------------|
| 1. <i>Ædœagus</i> present; basal membrane long, conical, divided; no basal chitinized appendages..... | <i>Anopheles</i> ² |
| <i>Ædœagus</i> absent; basal membrane slight; basal chitinized organs present | 2 |
| 2. Unci only present, undivided, capitate..... | <i>Aedeomyia</i> |
| Unci and harpes present, in two pairs..... | 3 |
| 3. Unci separated, hooked; harpes slender, columnar, opposed to the unci | <i>Uranotania</i> |
| Unci columnar or divided; harpes broad, concave, the tips toothed or spinose, parallel to the unci..... | 4 |
| 4. Side piece with a hollow basal lobe tipped by stout setæ, modified in the higher forms, but the tip persisting as an appendage of the side piece, bearing spines, etc..... | 6 |
| Side piece without a hollow basal lobe, devoid of lobes, except in the higher forms, where lobes appear secondarily, but not hollow | 5 |

¹Howard, Dyar and Knab. The Mosquitoes of North and Central America and the West Indies, iii, 1915.

²*Coelodiazesis* is not distinguishable.

5. Adjacent basal lobe, if present, small and setose, never produced with a single terminal spine.....*Aedes* (Old World stock)
 Adjacent basal lobe developed into an harpago.
Aedes (New World stock)¹
6. Unci undivided 7
 Unci divided into two or more outwardly directed plates..... 11
7. Basal lobe conical with several terminal setæ..... 8
 Basal lobe with a single stout rod, often produced.....*Mansonia*²
8. Harpes very long, prominent; unci long, pointed.....*Megarhinus*
 Harpes and unci moderate..... 9
9. Unci membranous, paired, with an outwardly directed basal chitinization*Climacura*
 Unci cylindrical, chitinized, revolute..... 10
10. Harpes normal, concave, with thickened margins and dentate tip,
Orthopodomyia
 Harpes modified, narrow, recurved, prominent.....*Culiseta*³
11. Harpes few-toothed*Culicella*
 Harpes with a crown of spines.....*Culex*

The genus *Culex* divides into two main sections on the genitalic characters. In the first, *Culex* proper, the harpes are tufted at tip with numerous spines, and have a longer or shorter basal arm. The unci form three parts, later four by subdivision of the original second plate. The first plate is generally triangular and heavily chitinized, having a socket near the middle into which a ligament locks that serves to open the plates. This structure is first noticeable in *Culicella dyari* (Pl. III, fig. 2) where it is rather imperfectly developed. The development in *Culex* (*Jamesia*) *concolor* (Pl. III, fig. 3) is not much better. In *Lutzia bigoti* (Pl. IV, fig. 6), the structure has improved and it can be seen fully developed in any of the true *Culex*, as in the case of *Culex* (*Culex*) *declarator* (Pl. III, fig. 4). In *Transculicia*, the plate is thickened and laminate (Pl. IV, fig. 12). The second plate is seen in membranous form in *Culicella dyari* (Pl. III, fig. 2); in *Jamesia* it has become chitinized (Pl. III, fig. 3); in *Lutzia*, toothed (Pl. IV, fig. 6). This condition is intensified in the true *Culex*

¹ Including *Haemagogus* and *Psorophora*.

² = *Taeniorhynchus* Arribáizaga according to intention and description, but not according to designation of type.

³ = *Theobaldia* Neveu-Lemaire, preoccupied by *Theobaldius* Nevill.

and then again disappears (Pl. III, fig. 5; Pl. IV, figs. 7-11). The third plate arises as a tooth on the second, as in *Culex stenolepis* (Pl. IV, fig. 7). This tooth enlarges, as in *Culex coronator* (Pl. IV, fig. 8), becomes basal, as in *Culex factor* (Pl. IV, fig. 9), separates as in *Culex declarator* (Pl. III, fig. 5), and finally becomes quite detached as in *Culex quinquefasciatus* (Pl. IV, fig. 11). The fourth plate is small and often hard to find, possibly absent. It occurs in the form of a pair of rods protecting the anus (Pl. III, fig. 1; Pl. IV, fig. 12).

The lobe of the side piece bears primitively three setæ. To these certain others are added and finally the lobe becomes subdivided, but only slightly modified. In one form, *Phalangomyia*, there is a modification of the side pieces, which, though striking, is not fundamental, as the three primitive setæ can be easily traced (Pl. III, fig. 1).

The second general group, *Melanoconion*, is much more modified. The harpes have the tip comb-shaped, the spines in a single row, the basal arm represented by a rounded process or absent. The divisions of the unci are complex, and I am not sure of their homology. The difficulty of the study is increased by the fact that clear mounts are not always to be had of critical species of which the material may be scanty. Apparently there are primitively four plates as in *Culex (Tinolestes) latisquama* (Pl. IV, fig. 14) and *Culex (Micraëdes) chalcocorystes* (Pl. IV, fig. 15). The first is a large outer sheathing plate, shown disjointed from its socket in the figure; the second a spatulate structure; the third large and furcate; the fourth rod-like with modified tip. In *Deinocerites*, the outer plate seems to be gone, the second elongated (Pl. IV, fig. 13). In the higher forms, the fourth plate seems to have disappeared, while the second assumes the form of a long hook, recurved around the other parts, as for example in *Culex (Micraëdes) bisulcatus* (Pl. IV, fig. 16) and *Culex (Charoporpa) educator* (Pl. IV, fig. 17).

The lobe of the side piece in *Melanoconion* begins simply, but becomes complex and subdivided in the higher groups, notably in *Charoporpa* and *Carrollia*.

The four main groups of *Culex* separate as follows:

1. Harpes tufted, the basal process, when present, arm-like; first uncal plate with an opening ligament..... 2
 Harpes comb-shaped, the basal process not arm-like; first uncal plate jointed in a socket or absent..... 3
2. Side piece essentially unmodified.....*Culex*
 Side piece excavated, with false jointed arms.....*Phalangomyia*
3. First uncal plate absent, the second produced and spatulate,

Deinocerites

First uncal plate present, forming an outer sheath....*Melanoconion*

In more detail, with the characters shifted a little in order to be more easily followed, the subgenera separate as below.

In the following separation of species, it has been my aim to recognize only such species as differ appreciably in the genitalia and I have accordingly united all those with similar genitalia unless they showed appreciable differences in adult coloration or larval structure. In some instances I may have united really distinct species, owing to the fact that differences in larvæ or habits were unknown to me. But even allowing for this, there remains a very considerable change from the account given in the monograph in the direction of the reduction in the number of species to be recognized. In the monograph, we relied on the coloration of the adults and larval differences, and we carried out this scheme consistently, at the same time overdoing it a little. The study of the genitalia has led me to make comparisons where we had not suspected that comparisons should be made, and has resulted in the correction of certain errors of observation. When these corrections have been made and a little more latitude is allowed for variation in adult coloration, the account in the monograph will not differ greatly from that here set forth. The errors in that work all lie in the direction of too great subdivision of species and are therefore most easily to be corrected. It is perhaps unfortunate that a more intensive study of the male genitalia of *Culex* could not have been undertaken before that volume of the monograph went to press; but multiplicity of duties at the time rendered it impossible.

TABLE OF SUBGENERA OF THE GENUS CULEX

1. Lobe of side piece with three stout setæ or appendages, neither more nor less (not counting a few unmodified setæ from the general vestiture) 2
 Lobe of side piece with more or less than three appendages, or otherwise modified 6
2. Appendages of side piece setiform or rod-like..... 3
 These appendages shortened and modified..... 4
3. Unci of two unmodified plates.....*Jamesia*
 Second plate of unci toothed.....*Lutzia*
4. Central rod mushroom-shaped; marginal ones very stout,
Tinolestes
 Appendages in a triangle, the upper two blade-like, the lower spine-like 5
5. Harpes spinose with basal arm.....*Transculicia*
 Harpes comb-shaped, without basal arm.....*Deinocerites*
6. Harpes tufted 7
 Harpes comb-shaped 10
7. Lobe of side piece divided into a triangular setose portion with a separate articulation, two setæ on a lobe and a club-shaped appendage beyond*Phalangomyia*
 This lobe not so formed..... 8
8. Lobe of side piece with more than three appendages..... 9
 Lobe of side piece with less than three appendages.....*Cacoculex*
9. Plates 2 and 3 of unci absent, 1 and 4 present.....*Neoculex*
 Plate 2 of unci present.....*Culex*
10. Fourth plate of the unci quadrately angled, ending in a retrose tooth*Microculex*
 Fourth plate of unci without a retrose tooth..... 11
11. Basal division of lobe of side piece a long arm bearing terminal setæ or leaves.....*Carrollia*
 This part divided or, if single, not a long arm..... 12
12. Clasp filament simple, the spine appendiculate..... 13
 Clasp filament modified..... 14
13. Outer division of lobe of side piece with six or more stout setæ*Micraedes*
 This part not so formed.....*Melanoconion*
14. Clasp filament not swollen at tip*Isostomyia*
 Clasp filament swollen at tip..... 15
15. Clasp filament elongated, with snout-like termination...*Charoporpa*
 This part bluntly rounded with subspherical tip.....*Mochlostyrax*

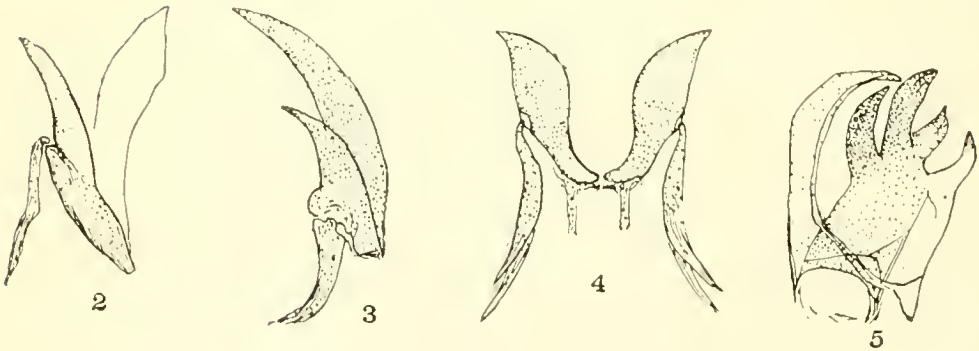
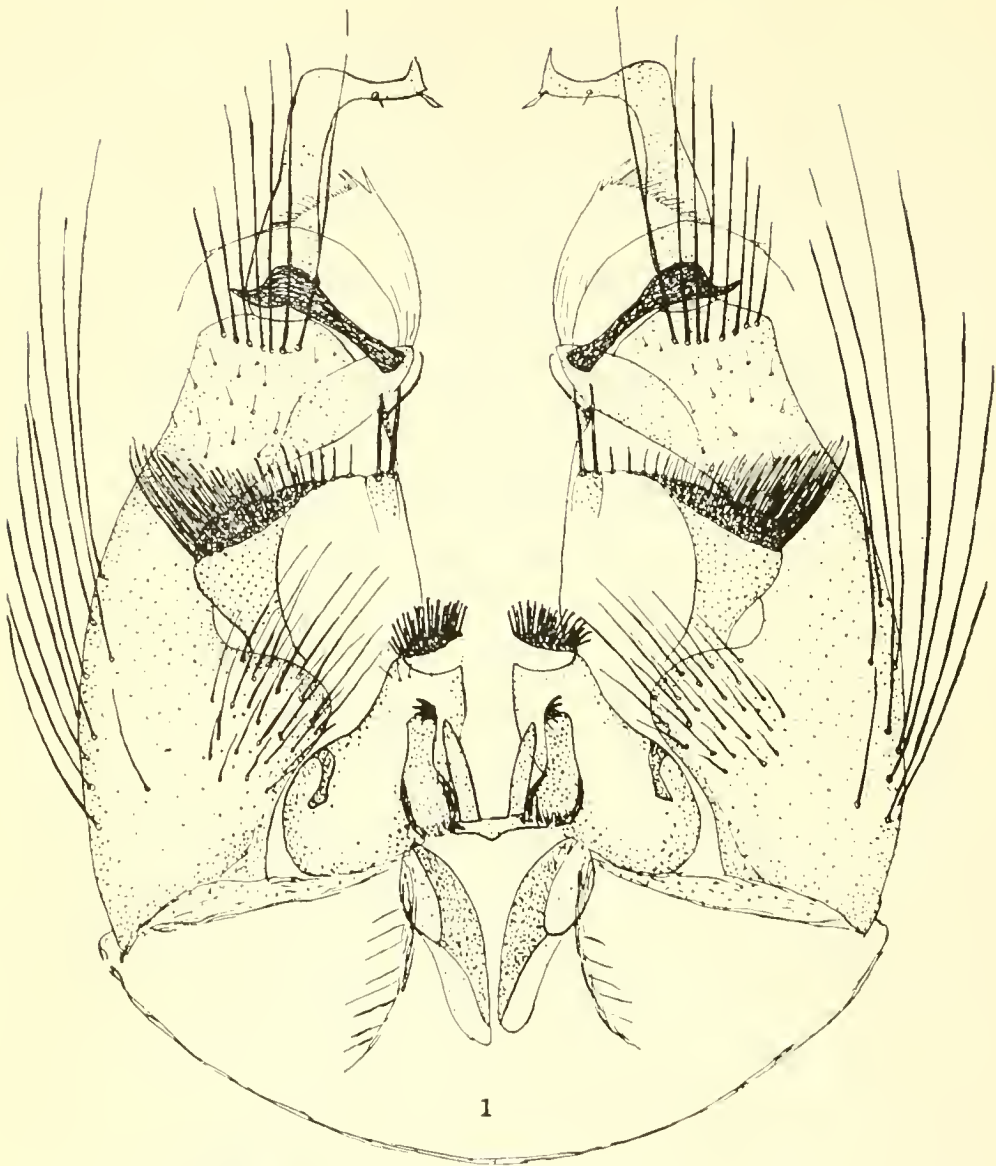
EXPLANATION OF PLATES

PLATE III

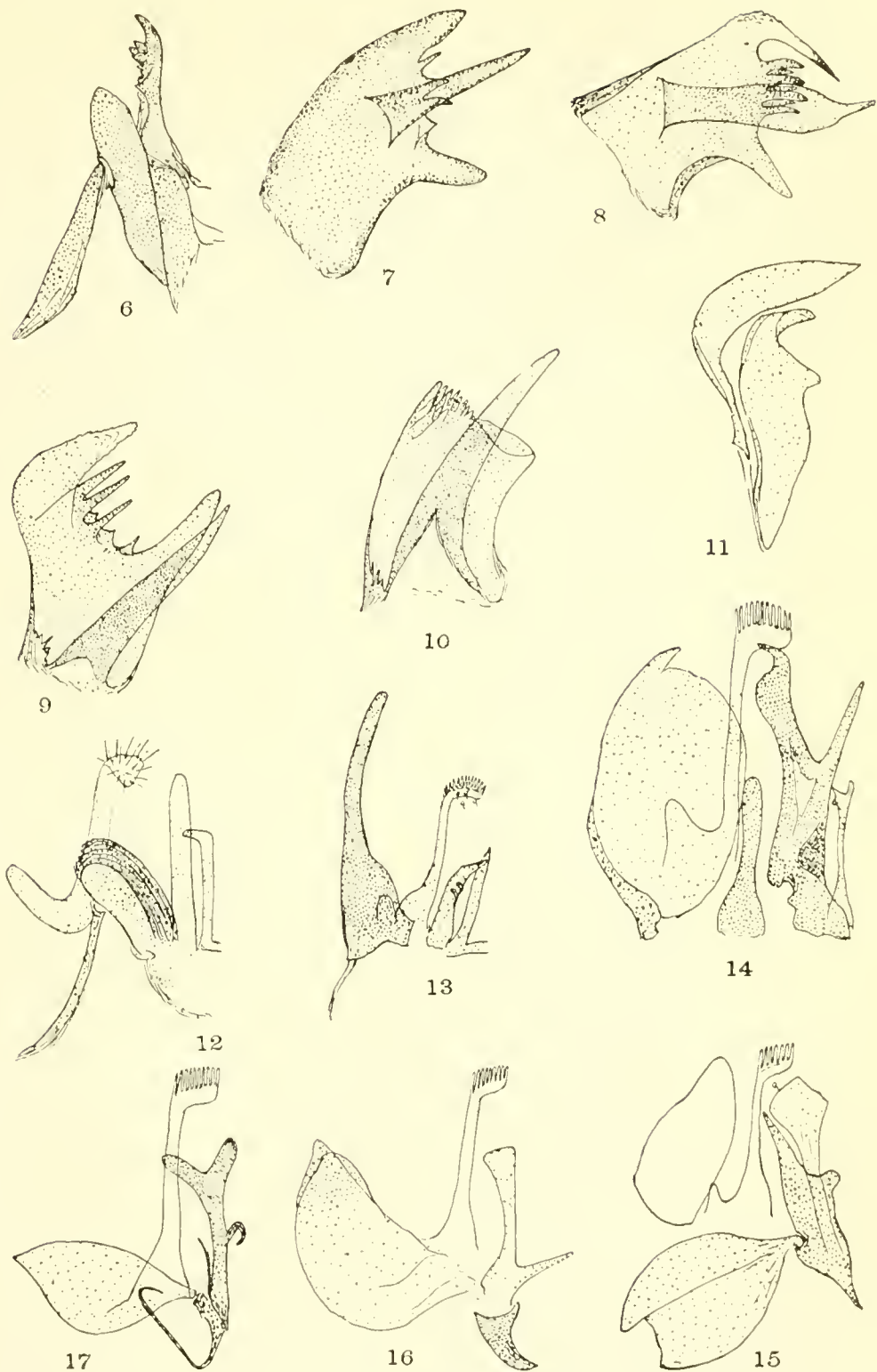
- Fig. 1. Genitalia of *Culex (Phalangomyia) debilis* Dyar and Knab.
Fig. 2. *Culicella dyari* Coq., uncal plates 1 and 2.
Fig. 3. *Culex (Jamesia) concolor* Desv., uncal plates 1 and 2.
Fig. 4. *Culex (Culex) declarator* Dyar and Knab, uncal plate 1.
Fig. 5. The same, uncal plates 2 and 3.

PLATE IV

- Fig. 6. *Culex (Lutzia) bigoti* Bell., uncal plates 1 and 2.
Fig. 7. *Culex (Culex) stenolepis* Dyar and Knab, uncal plates 2 and 3.
Fig. 8. *Culex (Culex) coronator* Dyar and Knab, uncal plates 2 and 3.
Fig. 9. *Culex (Culex) factor* Dyar and Knab, uncal plates 2 and 3.
Fig. 10. *Culex (Culex) interrogator* Dyar and Knab, uncal plates 2 and 3.
Fig. 11. *Culex (Culex) quinquefasciatus* Say, uncal plates 2 and 3.
Fig. 12. *Culex (Transculicia) cleuthera* Dyar, harpes and unci.
Fig. 13. *Culex (Deinocerites) spanius* Dyar and Knab, harpes and unci.
Fig. 14. *Culex (Tinolestes) latisquama* Coq., harpes and unci.
Fig. 15. *Culex (Micraëdes) chalcocorystes* Mart., harpes and unci.
Fig. 16. *Culex (Micraëdes) bisulcatus* Coq., harpes and unci.
Fig. 17. *Culex (Chocroporpa) educator* Dyar and Knab, harpes and unci.



GENITALIA OF CULEX



GENITALIA OF CULEX

Genus CULEX Linnaeus

Subgenus JAMESIA Christophers

Jamesia Christ., Sci. Mem. Med. Ind., n.s., No. 25, 12, 1906.

There are no American species in this subgenus, which was proposed for *Culex tigripes* Grandpré and *C. concolor* Robineau-Desvoidy of India.

Subgenus LUTZIA Theobald

Lutzia Theobald, Mon. Culic., iii, 155, 1903.

TABLE OF SPECIES

1. Tooth on basal section of second plate of unci short and blunt,
bigoti
 This tooth long and sharp.....*allostigma*

1. **Culex (Lutzia) bigoti** Bellardi.

Lutzia bigoti Howard, Dyar and Knab, Monogr., iii, 468, 1915.

2. **Culex (Lutzia) allostigma** Howard, Dyar and Knab.

Lutzia allostigma Howard, Dyar and Knab, Monogr., iii, 471, 1915.

Subgenus PHALANGOMYIA Dyar and Knab

Phalangomyia Dyar and Knab, Ins. Ins. Mens., ii, 58, 1914.

3. **Culex (Phalangomyia) debilis** Dyar and Knab.

Phalangomyia debilis Dyar and Knab, Ins. Ins. Mens., ii, 58, 1914.

The side pieces are peculiarly and highly evolved (Pl. III, fig. 1), but the basal parts are of a simple *Culex* type, much as in *Lutzia*. In the figure, the first uncal plates are shown thrown back, exposing the second and fourth plates; no trace of the third plate has developed.

Subgenus CULEX Linnaeus

Culex Linnaeus, Syst. Nat., 10th ed., 602, 1758.

TABLE OF SPECIES

- | | |
|---|----|
| 1. Lobe of side piece entire..... | 2 |
| Lobe of side piece divided..... | 12 |
| 2. Lobe of side piece with three rods, a leaf and a seta..... | 3 |
| Lobe of side piece with additional appendages..... | 4 |

3. Second plate of unci with the tooth arising from the base; a radiating pecten in the angle.....*inflictus, factor*
This plate with the tooth arising in the middle; no pecten at the angle *stenolepis*
4. Lobe of side piece with three rods, a seta or filament, a leaf and a seta 5
This part with additional appendages..... 9
5. Second plate of unci with two broad arms and a central mass of close denticles*corniger*
This plate not so formed..... 6
6. Second plate of unci with two long arms with a number of teeth between; a long tooth from basal part..... 7
This plate not so formed..... 8
7. Upper limb of second plate of unci denticulate,
tarsalis, stigmatosoma, eumimetes
This limb entire.....*erythrothorax, salinarius, janitor, secutor*
This limb with a double clasp on a pedicle.....*mollis, equivocator*
8. Second plate of unci of three large teeth.....*declarator*
This plate quadrate, denticulate on upper half.....*interrogator*
This plate of two blunt teeth.....*restuans*
9. Lobe of side piece with five rods, a leaf and a seta.....*reflector*
This lobe with three rods, two setæ, a filament, a leaf and a seta 10
10. Second plate of unci toothed as in *stenolepis*.....*pinarocampa*
This plate not toothed..... 11
11. Fourth plate of unci upright, pointed.....*quinquefasciatus*
This plate oblique and tubular.....*pipiens*
12. Lobe of side piece without a leaf-like appendage..... 13
A leaf present on a separate piece..... 15
13. Harpes weak with basal recurved branch..... 14
Basal branch obsolete.....*uplicator*
14. Lower part of lobe of side piece with three rods.....*coronator*
This part with 8 to 13 setæ.....*ousqua*
15. Second plate of unci with two arms and group of small teeth between; third plate a stout tooth.....*sphinx*
This plate without arms; third plate distinct and broad..*extricator*

4. *Culex* (*Culex*) *inflictus* Theobald.

Culex inflictus Theobald, Mon. Culic., ii, 115, 1901.

Culex scholasticus Theobald, Mon. Culic., ii, 120, 1901.

Culex microsquamatus Grabham, Can. Ent., xxxvii, 407, 1905.

Culex prasinopleurus Martini, Ins. Ins. Mens., ii, 68, 1914.

var. *carmodyae* Dyar and Knab.

Culex carmodyæ Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 210, 1906.

var. **palus** Theobald.

Culex palus Theobald, Mon. Culic., iii, 194, 1903.

Culex similis Theobald, Mon. Culic., iii, 207, 1903.

Culex regulator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 213, 1906.

C. infictus has the abdomen without bands; in *palus* narrow basal segmental bands are present; in *carmodyæ* there are very faint brown rings at both ends of the tarsal joints. This variety seems confined to Santo Domingo, although not all the specimens from there are so affected. The larva of *microsquamosus* is really spiculate and not glabrous, as given in the monograph by error; the proboscis also is not swollen at the tip. In the larva of *carmodyæ* there were probably four hair-tufts on the tube, one having been detached and not three as given in the monograph. They agree entirely otherwise.

5. **Culex (Culex) factor** Dyar and Knab.

Culex factor Dyar and Knab, Jour. N. Y. Ent. Soc., xiv, 212, 1906.

Culex aikenii Dyar and Knab (larvæ only), Proc. U. S. Nat. Mus., xxxv, 61, 1908 (not *Gnophodeomyia aikenii* Aiken).

Culex proximus Dyar and Knab, Proc. Ent. Soc. Wash., xi, 38, 1909.

Culex lachrimans Dyar and Knab (in part), Smiths. Misc. Colls., quart. iss., lii, 259, 1909.

The genitalia are not distinguishable from *infictus*; but the adult female has basal abdominal bands not widened at the sides, although they may be absent. The larva has the air tube a little shorter than in *infictus*; the third pair of head hairs are more approximate. In *proximus* the skin of the larva is really spicular, not glabrous as erroneously stated in the monograph.

6. **Culex (Culex) stenolepis** Dyar and Knab.

Culex stenolepis Howard, Dyar and Knab, Monog., iii, 249, 1915.

7. **Culex (Culex) pinarocampa** Dyar and Knab.

Culex pinarocampa Howard, Dyar and Knab, Monog., iii, 251, 1915.

8. *Culex (Culex) corniger* Theobald.

Culex corniger Howard, Dyar and Knab, Monog., iii, 240, 1915.

The genus *Trichopronomyia* Theobald is available for this species, but, although it is unique, I do not think the distinctions are strong enough for a subgeneric separation.

9. *Culex (Culex) tarsalis* Coquillett.

Culex tarsalis Howard, Dyar and Knab, Monog., iii, 230, 1915.

10. *Culex (Culex) stigmatosoma* Dyar.

Culex stigmatosoma Howard, Dyar and Knab, Monog., iii, 236, 1915.

11. *Culex (Culex) eumimetes* Dyar and Knab.

Culex eumimetes Howard, Dyar and Knab, Monog., iii, 238, 1915.

The genitalia agree with *tarsalis* while the adult is colored like *stigmatosoma*, though there is nothing very decisive about this as the difference between *tarsalis* and *stigmatosoma* is slight, consisting only in the difference in the number of teeth on the second uncal plate, which varies. Probably *eumimetes* is the same as *stigmatosoma*; the larval differences on which the species was founded and which we repeat in the monograph with distinctly less emphasis do not exist.

It will be noted that *duplicator*, which falls here on coloration, is entirely unrelated on genitalic characters, thus confirming the value of the different wing-scaling.

12. *Culex (Culex) erythrothorax* Dyar.

Culex erythrothorax Howard, Dyar and Knab, Monog., iii, 315, 1915.

13. *Culex (Culex) salinarius* Coquillett.

Culex salinarius Howard, Dyar and Knab, Monog., iii, 373, 1915.

14. *Culex (Culex) janitor* Theobald.

Culex janitor Howard, Dyar and Knab, Monog., iii, 258, 1915.

The larvæ differ from allied species in having the antennæ without the "notch," agreeing in this with *restuans*.

15. **Culex (Culex) secutor** Theobald.

Culex secutor Theobald, Mon. Culic., ii, 321, 1901.

Culex lamentator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 219, 1906.

Culex toweri Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 13, 1907.

The three names were given to specimens from Jamaica, Santo Domingo, and Porto Rico, respectively, but I think only one species is represented, doubtless occurring in Cuba also. The larva has the tufts of the air tube crowded back along the ventral line as in *tarsalis*, the normal symmetry being thereby destroyed.

16. **Culex (Culex) mollis** Dyar and Knab.

Culex mollis Howard, Dyar and Knab, Monog., iii, 267, 1915.

Hardly distinguishable from *equivocator*; but the adult female has basal abdominal white bands, which are absent in the other species. The specimens are from Trinidad.

17. **Culex (Culex) equivocator** Dyar and Knab.

Culex equivocator Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 203, 1907.

Culex elocutilis Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 255, 1909.

Described from Panama. Specimens are before me extending the range to British Guiana (H. W. B. Moore).

18. **Culex (Culex) declarator** Dyar and Knab.

Culex declarator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex jubulator Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 201, 1907.

Culex vindicator Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 255, 1909.

Culex dictator Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 255, 1909.

var. **proclamator** Dyar and Knab.

Culex proclamator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex inquisitor Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex revelator Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 202, 1907.

The adult female has the abdomen with basal segmental white spots, sometimes extended as dull whitish bands; but the central spot whiter or produced. In the male there are even white bands. The genitalia have a peculiar second uncal plate, consisting of three stout claws from a circular base. The larva has the head hairs in threes or four-three, the skin spicular, the air-tube with three tufts, the middle one moved out of line; pecten commonly long, but not uniformly so.

In our original descriptions of *declarator*, *proclamator* and *inquisitor*, from larvæ, three lengths of the air-tube pecten are shown; but these characters become less distinct the more specimens are examined. Nevertheless, two races seem indicated. In *declarator* proper, the pecten is short, the teeth about 4 x 1 and about 14 in number. It occurs from Trinidad to Panama, including the Lesser Antilles, specifically Dominica and St. Thomas. In *proclamator* the pecten is longer, the teeth 5 x 1 or over and 18 to 20 in number. It occurs from Mexico to Panama, and the two forms may coalesce in the latter region.

The exact position of the hair tufts on the air tube seems to be unreliable. The character found in the adult of the white tip of the last tarsal joint being present or absent seems to be variable. The banding of the abdomen as given in the monograph, I do not verify on reëxamination.

19. *Culex (Culex) interrogator* Dyar and Knab.

Culex interrogator Howard, Dyar and Knab, Monog., iii, 417, 1915.

Quite erroneously placed in the monograph in the *Melanoconion* group. The proboscis should not have been taken as "swollen at the tip," or, if so, then the character is worthless, for this is a true *Culex*.

20. *Culex (Culex) restuans* Theobald.

Culex restuans Howard, Dyar and Knab, Monog., iii, 333, 1915.

21. **Culex (Culex) reflector** Dyar and Knab.

Culex reflector Howard, Dyar and Knab, Monog., iii, 419, 1915.

The same remark applies as for *interrogator*.

22. **Culex (Culex) quinquefasciatus** Say

Culex quinquefasciatus Howard, Dyar and Knab, Monog., iii, 345, 1915.

Culex revocator Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 256, 1909.

Culex aseychæ Dyar and Knab, Ins. Insc. Mens., iii, 112, 1915.

The genitalia furnish no characters for considering *revocator* as a distinct species peculiar to Jamaica.

23. **Culex (Culex) pipiens** Linnaeus.

Culex pipiens Howard, Dyar and Knab, Monog., iii, 360, 1915.

Culex flavipes Macquart, Dipt. Exot., i, part 1, 35, 1838.

Culex flavipes Brèthes, Anal. Mus. Nac. Hist. Nat. B. A., xxviii, 210, 1916.

There seems now no doubt that *pipiens* is more widely distributed than given by us in the monograph. Not only does it occur in California, as shown by Mr. Knab and myself (Ins. Insc. Mens., v, 178, 1917), but the excellent figures recently published by Juan Brèthes show that it is widespread in Chile and Argentina, under the name *Culex flavipes*. The name *flavipes* must therefore be hereafter cited in the synonymy of *pipiens* instead of *quinquefasciatus*, as in the monograph (vol. iii, p. 345, 1915).

24. **Culex (Culex) coronator** Dyar and Knab.

Culex coronator Howard, Dyar and Knab, Monog., iii, 286, 1915.

25. **Culex (Culex) ousqua**, new species.

Male genitalia. Lobe of side piece divided, the inner portion large and conical, bearing 10 to 13 hairs, no spines being distinguishable; outer portion small, distinct, bearing about five hairs. Otherwise as in *coronator*, the second plate of unci commonly with fewer teeth, four to seven.

The male adult has faint white rings at both ends of the tarsal joints, the last hind tarsal white; abdomen with white basal segmental bands, mesially produced, as in *coronator*.

Type, male, No. 21602, U. S. Nat. Mus.; Panama (Busck 181.1). Also Canal Zone, Panama (Jennings 52) and Culebra, Canal Zone, Panama (L. H. Dunn, C-77).

The larva has several spines on one side of the air tube subapically.

26. *Culex (Culex) duplicator* Dyar and Knab.

Culex duplicator Howard, Dyar and Knab, Monog., iii, 235, 1915.

27. *Culex (Culex) extricator* Dyar and Knab.

Culex extricator Howard, Dyar and Knab, Monog., iii, 325, 1915.

28. *Culex (Culex) sphinx* Howard, Dyar and Knab.

Culex sphinx Howard, Dyar and Knab, Monog., iii, 301, 1915.

Culex sphinx Dyar and Knab, Ins. Ins. Mens., iii, 114, 1915.

Subgenus NEOCULEX Dyar

Neoculex Dyar, Proc. Ent. Soc. Wash., vii, 45, 48, 1905.

TABLE OF SPECIES

- | | |
|--|------------------|
| 1. Bridge of the fourth uncal plate broad..... | <i>saxatilis</i> |
| This bridge narrow..... | <i>derivator</i> |

29. *Culex (Neoculex) saxatilis* Grossbeck.

Culex territans Howard, Dyar and Knab, Monog., iii, 293, 1915.

30. *Culex (Neoculex) derivator* Dyar and Knab.

Culex derivator Howard, Dyar and Knab, Monog., iii, 290, 1915.

Subgenus CACOCULEX, new

With the characters of the table. Type, *Culex habilitator* Dyar and Knab.

31. *Culex (Cacoculex) habilitator* Dyar and Knab.

Culex habilitator Howard, Dyar and Knab, Monog., iii, 262, 1915.

Culex eremita Howard, Dyar and Knab, Monog., iii, 261, 1915.

Subgenus TRANSCULICIA Dyar

Transculicia Dyar, Ins. Ins. Mens., v, 184, 1917.

32. *Culex (Transculicia) eleuthera* Dyar

Culex (Transculicia) eleuthera Dyar, Ins. Ins. Mens., v, 184, 1917.

Subgenus *DEINOCERITES* Theobald*Deinocerites* Theobald, Mon. Culic., ii, 215, 1901.*Brachomyia* Theobald, Mon. Culic., ii, 343, 1901.*Dinomimctes* Knab, Journ. N. Y. Ent. Soc., xv, 120, 1907.*Dinanamesus* Dyar and Knab, Smiths. Misc. Colls., quart. iss.,
lii, 259, 1909.

Some of the *Culex* addicted to crab-holes have developed elongated antennal joints, on which genera and even higher groups have been founded. From the point of view of the genitalia, this appears to be an over-valuation. However, there are some good larval characters, and *Deinocerites* may be conveniently considered a genus. But I do not think that *Dinomimctes* and *Dinanamesus* will hold.

TABLE OF SPECIES

- | | |
|---|---------------------|
| 1. Claws of the clasp filament equal..... | 2 |
| These claws unequal..... | 4 |
| 2. Teeth of harpe about 15..... | 3 |
| Teeth of harpe over 20..... | <i>melanophylum</i> |
| 3. Harpal plate longer, exceeding the lobes of side piece..... | <i>cancer</i> |
| This plate shorter, not exceeding lobe of side piece..... | <i>troglydytus</i> |
| 4. Third uncal plate simple; second with two revolute spines.... | <i>spanius</i> |
| Second plate with a horn and many lateral spines; third plate spatulate | 5 |
| 5. Harpal plate long and slender beyond base..... | <i>epitedeus</i> |
| This plate shorter, not exceeding the lobe of side piece..... | <i>pseudes</i> |
33. **Culex (Deinocerites) spanius** Dyar and Knab.
Dinanamesus spanius Howard, Dyar and Knab, Monog., iii, 213, 1915.
34. **Culex (Deinocerites) epitedeus** Knab.
Dinomimctes epitedeus Howard, Dyar and Knab, Monog., iii, 197, 1915.
35. **Culex (Deinocerites) pseudes** Dyar and Knab.
Deinocerites pseudes Howard, Dyar and Knab, Monog., iii, 210, 1915.
36. **Culex (Deinocerites) troglodytus** Dyar and Knab.
Deinocerites troglodytus Howard, Dyar and Knab, Monog., iii, 206, 1915.

37. **Culex (Deinocerites) cancer** Theobald.

Deinocerites cancer Howard, Dyar and Knab, Monog., iii, 201, 1915.

38. **Culex (Deinocerites) melanophylum** Dyar and Knab.

Deinocerites melanophylum Howard, Dyar and Knab, Monog., iii, 207, 1915.

Subgenus TINOLESTES Coquillett

Tinolestes Coquillett, Proc. Ent. Soc. Wash., vii, 185, 1905.

39. **Culex (Tinolestes) latisquama** Coquillett.

Culex latisquama Howard, Dyar and Knab, Monog., iii, 303, 1915.

Subgenus MICRAËDES Coquillett

Micraëdes Coquillett, Proc. Ent. Soc. Wash., vii, 185, 1905.

TABLE OF SPECIES

1. First plate of unci very broad, notched, and jointed to second plate,
chalcocorystes
 This plate triangulate, scarcely modified.....*bisulcatus*
 This plate attenuate on the outer half and curled.....*restrictor*

40. **Culex (Micraëdes) chalcocorystes** Martini.

Culex chalcocorystes Martini, Ins. Ins. Mens., ii, 70, 1914.

The unci are almost exactly as in *latisquama*, and on that basis this species might with propriety be placed in *Tinolestes*. The present location is based on the structure of the lobe of the side piece.

41. **Culex (Micraëdes) bisulcatus** Coquillett.

Culex bisulcatus Howard, Dyar and Knab, Monog., iii, 306, 1915.

42. **Culex (Micraëdes) restrictor** Dyar and Knab.

Culex restrictor Howard, Dyar and Knab, Monog., iii, 331, 1915.

This species has affinities with *Melanoconion* and might with almost equal propriety be placed there.

Subgenus ISOSTOMYIA Coquillett

Isostomyia Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. ser. 11, 16, 24, 1906.

This name is here employed in the sense intended by Coquillett, and not in that which his citation of type would imply.

43. **Culex (Isostomyia) conservator** Dyar and Knab.

Culex conservator Howard, Dyar and Knab, Monog., iii, 308, 1915.

This species is congeneric with *restrictor* as far as uncus development goes or lobes of side piece. It is separated on account of the modification of the clasp filament.

Subgenus MELANOCONION Theobald

Melanoconion Theobald, Mon. Culic., iii, 238, 1903.

TABLE OF SPECIES

1. Upper division of lobe of side piece with a leaf and three setæ,
atratus
 This part with a seta, a leaf, and two setæ.....*falsificator*

44. **Culex (Melanoconion) atratus** Theobald.

Culex atratus Howard, Dyar and Knab, Monog., iii, 388, 1915.

45. **Culex (Melanoconion) falsificator** Dyar and Knab.

Culex falsificator Howard, Dyar and Knab, Monog., iii, 425, 1915.

Culex agitator Howard, Dyar and Knab (in part, adult only),
 Monog., iii, 384, 1915.

This Cuban species comes very close to *atratus* from Jamaica and may not be distinct. The apparent genitalic difference may be due to the position of the parts on the slide. The colorational differences given in the monograph appear unreliable. The adults associated with the larvæ of *agitator* do not appertain to that species.

Subgenus CHÆROPORPA, new¹

With the characters of the table. Type, *Culex anips* Dyar.

TABLE OF SPECIES

1. Clasp filament with a horn-like tuft before tip; terminal spine
 uniform 2

¹ *Gnophodomyia* Theobald, type *inornata* Theobald (= *aikenii* Aiken), may be an older name for the subgenus *Choeroporpa* or a synonym of *Melanoconion*.

- Clasp filament narrowed at tip, the terminal spine widened and appendiculate 4
2. Anterior crest of clasp filament of appressed or consolidated spines. 3
This crest composed of fine hairs.....*anips*
3. Terminal spine of clasp stout; anterior crest solid.....*erraticus*
This spine delicate; anterior crest of compressed spines....*peccator*
4. Outer division of lobe of side piece with a leaf-like appendage.... 5
Without this structure..... 9
5. The leaf large and expanded, exceeding the accompanying setæ. 6
The leaf small and oval, not exceeding the accompanying setæ. 8
6. Harpes with delicate hair-like pecten, the marginal tooth stout,
mutator
Harpes with a distinct comb..... 7
7. Harpal comb of about 8-10 teeth; leaf of outer division of lobe
of side piece adjacent to setæ.....*leprincei*
Harpal comb of about 6 teeth; the leaf free from setæ...*invocator*
8. Outer division of lobe of side piece with the leaf adjacent to the
two filaments on basal margin; second plate of unci bifid,
conspirator
This leaf adjacent to the three filaments on the distal margin;
second plate of unci trifid.....*bastagarius*, *carcinophilus*
9. Second plate of unci without an adjacent pair of hooks or
spines 10
This plate with hooks or spines..... 11
10. Limbs of second plate of unci subequal.....*chrysonotum*
Outer limb of this plate long, the inner short and often bent at
right angles*elevator*
11. Second plate of unci with a hook on inner margin.....*educator*
This plate with a spine on each margin..... 12
12. Apical portion of second plate quadrate and denticulate..*iolambdis*
This portion smooth and arcuate.....*inhibitor*

46. **Culex (Chæroporpa) anips** Dyar.

Culex anips Dyar, Ins. Ins. Mens., iv, 48, 1916.

Culex (Melanoconion) anips Dyar and Knab, Ins. Ins. Mens.,
v, 180, 1917.

47. **Culex (Chæroporpa) erraticus** Dyar and Knab.

Culex (Melanoconion) erraticus Dyar and Knab, Ins. Ins. Mens.,
v, 179, 1917.

48. **Culex (Chæroporpa) peccator** Dyar and Knab.

Culex (Melanoconion) peccator Dyar and Knab, Ins. Ins. Mens.,
v, 179, 1917.

49. **Culex (Chæroporpa) mutator** Dyar and Knab.

Culex mutator Howard, Dyar and Knab, Monog., iii, 422, 1915.

50. **Culex (Chæroporpa) leprincei** Dyar and Knab.

Culex leprincei Howard, Dyar and Knab, Monog., iii, 397, 1915.

Culex trachycampa Howard, Dyar and Knab, Monog., iii, 329, 1915.

The genitalia and larvæ of *trachycampa* and *leprincei* are alike. The separation of the adults in the monograph was due to an error of observation of the female proboscis, being called swollen in one case and not in the other—an error very easy to make.

51. **Culex (Chæroporpa) invocator** Pazos.

Culex invocator Howard, Dyar and Knab, Monog., iii, 323, 1915.

52. **Culex (Chæroporpa) conspirator** Dyar and Knab.

Culex conspirator Howard, Dyar and Knab, Monog., iii, 410, 1915.

53. **Culex (Chæroporpa) carcinophilus** Dyar and Knab.

Culex carcinophilus Howard, Dyar and Knab, Monog., iii, 412, 1915.

I have only one male mounted in poor condition and indistinguishable from *bastagarius*; but the larvæ differ obviously.

54. **Culex (Chæroporpa) bastagarius** Dyar and Knab.

Culex bastagarius Howard, Dyar and Knab, Monog., iii, 424, 1915.

55. **Culex (Chæroporpa) chrysonotum** Dyar and Knab.

Culex chrysonotum Howard, Dyar and Knab, Monog., iii, 310, 1915.

56. **Culex (Chæroporpa) inhibitor** Dyar and Knab.

Culex inhibitor Howard, Dyar and Knab, Monog., iii, 391, 1915

57. **Culex (Chæroporpa) educator** Dyar and Knab.

Culex educator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 217, 1906.

Culex elevator Howard, Dyar and Knab (in part), Monog., iii, 414, 1915.

Culex apateticus Howard, Dyar and Knab (in part), Monog., iii, 321, 1915.

58. **Culex (Chæroporpa) elevator** Dyar and Knab.

Culex elevator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 217, 1906.

Culex elevator Howard, Dyar and Knab (in part), Monog., iii, 414, 1915.

Culex apateticus Howard, Dyar and Knab (in part), Monog., iii, 321, 1915.

In the monograph we united *elevator* and *educator*; but the genitalia are obviously different. On the other hand, we created the new species *apateticus*, based on a mixture of *elevator* and *educator*. The types of *apateticus* are three of Jennings' No. 498, the mounted male being *elevator*, plus two of Jennings' No. 454 and one of Jennings' No. 522, the two mounted males being *educator*. We placed these in the monograph with *hesitator*, a *Mochlostyrax*, but this also was placed wrongly. Both species should have the female proboscis swollen at the tip, but we have put them in the "straight proboscis" section.

59. **Culex (Chæroporpa) iolambdis**, new species.

Male genitalia.—Comb of harpe with about eight teeth; second plate of unci with a horn on either side, the tip quadrately terminated and denticulate; outer division of lobe of side piece obsoletely subdivided, the proximal portion bearing a hooked filament; at the base is inserted a broad filament but not leaf-shaped, and on a scarcely distinguishable prominence below are three crooked filaments. Clasp filament not strongly swollen, the tip attenuated, truncate, with snout-like termination; a groove at end and straight oblique groove across; setæ very obscure; cresting pile very small, reaching to near end of snout.

Only one slide is before me; near *educator*, of which I hope it is not a distorted specimen.

The adult has the tarsi wholly black; palpi exceeding the proboscis, black, the last two joints sparsely and evenly haired. Abdomen entirely black dorsally with bronzy luster; the venter appears wholly black.

Type, male, No. 21603, U. S. Nat. Mus.; Panama, bred by Mr. A. Busck but at present without label.

It is possible that this is the adult of *Culex investigator* Dyar and Knab, described from Mexico, the adult being unknown. The larva of *investigator* falls in the table with *inhibitor*, with the adult of which *iolambdis* is allied.

Subgenus MOCHLOSTYRAX Dyar and Knab

Mochlostyrax Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 223, 1906.

TABLE OF SPECIES

1. Second plate of unci with a distinct radial pecten in one angle of the plate 2
Without this character..... 5
2. Basal lobes of penultimate segment minute, pointed, hairless,
reductor
These lobes larger with a few or many hairs..... 3
3. Basal lobe small, few haired; harpes with 6 teeth..... 4
Basal lobe large, many haired; harpes with 8 teeth.....*hesitator*
4. Tip of clasp filament foot-shaped.....*floridanus*
Tip of clasp filament roughly elliptical.....*pilosus*
5. Outer division of lobe of side piece forked, bearing many flat filaments but no leaf.....*caudelli*
This part entire, bearing two leaves and two filaments,
peribleptus, moorei

60. **Culex (Mochlostyrax) reductor** Dyar and Knab.

Culex reductor Howard, Dyar and Knab, Monog., iii, 399, 1915.

61. **Culex (Mochlostyrax) hesitator** Dyar and Knab.

Culex hesitator Howard, Dyar and Knab, Monog., iii, 319, 1915.

Placed in the wrong section in the monograph. The female proboscis should be swollen.

62. **Culex (Mochlostyrax) floridanus** Dyar and Knab.

Culex (Mochlostyrax) floridanus Dyar and Knab, Ins. Ins. Mens., v, 180, 1917.¹

63. **Culex (Mochlostyrax) pilosus** Dyar and Knab.

Culex pilosus Howard, Dyar and Knab, Monog., iii, 393, 1915.

¹ Fresh material shows that the Cuban species (*agitator* = *cubensis* = *mastigia*) must be again separated from the Floridian species (*floridanus* = *deceptor*) on adult colorational characters.

64. **Culex (Mochlostyrax) caudelli** Dyar and Knab.

Culex caudelli Howard, Dyar and Knab, Monog., iii, 395, 1915.

65. **Culex (Mochlostyrax) peribleptus** Dyar and Knab.

Culex (Mochlostyrax) peribleptus Dyar and Knab, Ins. Ins. Mens., v, 181, 1917.

66. **Culex (Mochlostyrax) moorei**, new species.

Female.—Vertex of head with narrow curved dark bronzy scales, reaching the front narrowly; flat scales black, with a few white ones intermixed, especially on the eye-margins. Mesonotum with sparse narrow curved dark bronzy brown scales, uniform. Abdomen black scaled with small lateral white spots at the bases of the segments; venter whitish, banded with black at the apices of the segments. Legs black, femora whitish beneath; knee spots small. Wings with the scales on the forks of second vein narrowly ovate.

Types, one male, two females, No. 21573, U. S. Nat. Mus.; Plantation Plaisance, Georgetown, British Guiana, April 10, 1910, bred from larvæ in a ditch (H. W. B. Moore).

Subgenus CARROLLIA Lutz

Carrollia Lutz, Imprensa Medica, 81, 1905.

TABLE OF SPECIES

- | | |
|---|-------------------|
| 1. Tip of clasp filament distorted and lobed..... | <i>iridescens</i> |
| Tip of clasp filament subspherical..... | <i>urichii</i> |

67. **Culex (Carrollia) iridescens** Lutz.

Carrollia iridescens Howard, Dyar and Knab, Monog., iii, 462, 1915.

68. **Culex (Carrollia) urichii** Coquillett.

Carrollia urichii Howard, Dyar and Knab, Monog., iii, 464, 1915.

Separate subgenera might be made for these two species on account of the shape of the clasp filament. That of *iridescens* is like *Charoporpa* greatly intensified, whereas that of *urichii* is on the type of *Mochlostyrax*.

Subgenus MICROCULEX Theobald

Microculex Theobald, Mon. Culic., v, 116, 1910.

TABLE OF SPECIES

1. Hairs of outer division of lobe of side piece gathered on a distinct capitate lobe 2
Not so formed..... 3
2. This lobe with a narrow leaf.....*consolator*
This lobe without a leaf.....*pleuristriatus*
3. Inner division of lobe of side piece free from the patch of setæ*jenningsi*
Not so formed..... 4
4. Area of lobe of side piece with many setæ..... 5
This area with few setæ..... 7
5. The majority of the setal patch situated beyond the lobe of side piece 6
Lobe in the midst of the setal patch.....*rejector, neglectus*
6. Comb of harpe with nine teeth.....*daumastocampa*
This comb with six teeth.....*imitator*
7. Some four setæ beyond the lobe of the side piece.....*inimitabilis*
Two setæ in this position.....*ocellatus*

69. **Culex (Microculex) consolator** Dyar and Knab.

Culex consolator Howard, Dyar and Knab, Monog., iii, 439, 1915.

70. **Culex (Microculex) pleuristriatus** Theobald.

Culex pleuristriatus Howard, Dyar and Knab, Monog., iii, 437, 1915.

Specimens are before me from British Guiana, bred by Mr. H. W. B. Moore from larvæ in Bromelias, Plantation Mocha, January 4, 1910.

71. **Culex (Microculex) jenningsi** Dyar and Knab.

Culex jenningsi Howard, Dyar and Knab, Monog., iii, 443, 1915.

72. **Culex (Microculex) neglectus** Lutz.

Culex neglectus Lutz in Bourroul, Mosq. do Brasil, 27, 1904.

The adult has black tarsi, though the genitalia resemble those of *rejector*, in which the tarsi are ringed.

73. **Culex (Microculex) rejector** Dyar and Knab.

Culex rejector Howard, Dyar and Knab, Monog., iii, 441, 1915.

74. **Culex (Microculex) daumastocampa** Dyar and Knab.

Culex daumastocampa Howard, Dyar and Knab, Monog., iii, 435, 1915.

75. *Culex (Microculex) imitator* Theobald.*Culex imitator* Howard, Dyar and Knab, Monog., iii, 430, 1915.**76. *Culex (Microculex) inimitabilis* Dyar and Knab.***Culex inimitabilis* Howard, Dyar and Knab, Monog., iii, 449, 1915.**77. *Culex (Microculex) ocellatus* Theobald.***Culex ocellatus* Howard, Dyar and Knab, Monog., iii, 446, 1915.

The following species, described from America, are unknown to me in the male at present writing:

Culex virgultus Theobald, Mon. Culic., ii, 123, 1901. Rio de Janeiro.*Aedes nigricorpus* Theobald, Mon. Culic., ii, 231, 1901. Amazons.*Culex nigripalpus* Theobald, Mon. Culic., ii, 322, 1901. Santa Lucia.*Culex humilis* Theobald, Mon. Culic., ii, 336, 1901. Brazil.*Aedeomyia americana* Neveu-Lemaire, Arch. de Parasit., vi, 5, 1902.*Melanoconion luteopleurus* Theobald, Mon. Culic., iii, 239, 1903. Para.*Melanoconion indecorabilis* Theobald, Mon. Culic., iii, 241, 1903. Para.*Melanoconion spissipes* Theobald, Mon. Culic., iii, 242, 1903. Trinidad.*Culex albipes* Lutz, Bourroul, Mosq. do Brasil, 6, 1904. Brazil.*Culex spinosus* Lutz, Imp. Med., Jan. 25, 1905. Brazil.*Culex lugens* Lutz, Imp. Med. Jan. 25, 1905. Brazil.*Melanoconion theobaldi* Lutz, Imp. Med., Feb. 10, 1905. Brazil.*Melanoconion fasciolatus* Lutz, Imp. Med., Feb. 10, 1905. Brazil.*Aedius amazonensis* Lutz, Imp. Med., Mar. 25, 1905. Amazons.*Gnophodeomyia inornata* Theobald, Journ. Econ. Biol., i, 21, 1905. British Guiana.¹*Culex mortificator* Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 210, 1906. Costa Rica.*Culex bahamensis* Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 210, 1906. Bahamas.*Culex simulator* Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 218, 1906. Trinidad.*Culex barbarus* Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 210, 1906. Trinidad.*Culex investigator* Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 216, 1906. Mexico.*Culex decorator* Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 218, 1906. Trinidad.*Culex gravitator* Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 218, 1906. Mexico.

¹ The name *inornata* being preoccupied in *Culex* by Williston in 1896, this form will take the name *aikenii* Aiken (Brit. Guiana Med. Ann., 1906, 60, 1907).

- Culex asymus* Dyar and Knab, Proc. Biol. Soc. Wash., xix, 169, 1906. Trinidad.
- Culex subfuscus* Theobald, Mon. Culic., iv, 403, 1907. Jamaica.
- Culex lateropunctata* Theobald, Mon. Culic., iv, 458, 1907. British Guiana.¹
- Melanoconion annulipes* Theobald, Mon. Culic., iv, 512, 1907. Jamaica.
- Culex taeniopus* Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 100, 1907. Nicaragua.
- Culex fur* Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 13, 1907. Panama.
- Culex corrigani* Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 203, 1907. Panama.
- Culex egberti* Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 214, 1907. Florida.
- Melanoconion chrysothorax* Peryassú, Mosq. do Brazil, 244, 1908. Brazil.²
- Melanoconion theobaldi* Peryassú, Os Culic. do Brazil, 236, 1908.
- Melanoconion fasciolatum* Peryassú, Os Culic. do Brazil, 239, 1908.
- Deinocerites tetraspathus* Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 260, 1909. Nicaragua.
- Culex ignobilis* Dyar and Knab, Proc. Ent. Soc. Wash., xi, 39, 1909. Cuba.
- Culex lynchii* Brèthes, Bol. Inst. Ent. y. Pat. Veg., i, 30, 1912. Argentina.
- Culex caraibeus* Howard, Dyar and Knab, Mosq. N. Cent. Am. & W. I., iii, 257, 1915. Barbados.
- Culex delys* Howard, Dyar and Knab, Mosq. N. Cent. Am. & W. I., iii, 317, 1915. Panama.
- Culex bonariensis* Brèthes, Ann. Mus. Nac. Hist. Nat., B. A., xxviii, 213, 1916. Argentina.
- Culex intricatus* Brèthes, Ann. Mus. Nac. Hist. Nat., B. A., xxviii, 214, 1916. Argentina.
- Culex pose* Dyar and Knab, Ins. Ins. Mens., v, 182, 1917. Texas.

¹ This is doubtless a synonym of *Culex equivocator* D. & K., as suggested by us in the monograph (vol. iii, p. 329, 1915).

² Not *Neomelaniconion chrysothorax* Newstead & Thomas. See Knab, Appendix to Report of First Expedition to South America, 1913, Harvard School of Tropical Medicine, 217, 1915.

A NOTE ON THE AMERICAN SPECIES OF MANSONIA

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

In discussing this genus in the monograph,¹ we lacked males of many of the species treated. We also received too late for insertion data on the oviposition of *M. titillans* Walk. This latter has been discussed by the writer and Mr. Knab in this journal (*Ins. Ins. Mens.*, iv, 61, 1916). Most of the missing males have now come to hand and the genitalic table may be recast as follows:

Clasp-filament branched; process from the angle of excavation of side piece long, swollen at tip, with a short inserted rod.

titillans Walker, *flaveolus* Coquillett

Clasp-filament simple; process short, at least shorter than the rod, not swollen at tip.

Rod and process both long, exceeding end of side-piece.

coticula Dyar & Knab

Process distinctly short; tip of rod not reaching end of side-piece.

Unci swollen at tip, with two outward and one retrose teeth.

fasciolatus Arribáizaga

Unci finely toothed at tip with double dentate inner membrane.

perturbans Walker

Unci simple, membranous.....*nigricans* Coquillett

Subgenus MANSONIA Blanchard

Eggs deposited attached to the under side of floating leaves.

Mansonia titillans Walker.

Howard, Dyar & Knab, *Monog.*, iii, 516, 1915.

Dyar & Knab, *Ins. Ins. Mens.*, iv, 61, 1916.

M. flaveolus Coq. is doubtless but a variation of *titillans*. The male genitalia do not differ and the single male type has now been matched by a female from Panama, the male being from the Island of St. Thomas. These localities are widely separated, showing that *flaveolus* occurs as a rare aberration of *titillans* throughout its range.

¹ Howard, Dyar & Knab, *Mosq. N. & Cent. Am. & W. I.*, iii, 504, 1915.

Mansonia pseudotitillans Theobald.

Panoplites pseudotitillans Theobald, Mon. Culic., ii, 178, 1901.

Mansonia pseudotitillans Theobald, Mon. Culic., v, 448, 1910.

Mansonia pseudotitillans Howard, Dyar & Knab, Monog., iii, 521, 1915.

Evidently close to *titillans* if not identical. It is described as slightly larger and of a yellowish brown tint. The male is not known.

Mansonia humeralis Dyar & Knab.

Dyar & Knab, Ins. Ins. Mens., iv, 61, 1916.

No male of this interesting species has yet come to hand, nor have we noted specimens from any other than the type locality. The genitalia should be of the type of *titillans*.

Mansonia amazonensis Theobald.

Panoplites amazonensis Theobald, Mon. Culic., ii, 182, 1901.

Mansonia amazonensis Theobald, Mon. Culic., v, 450, 1910.

Evidently allied to *humeralis*, but the golden scales cover the front of the mesonotum instead of being confined to the shoulders. The male is unknown.

Subgenus COQUILLETIDIA Dyar

Eggs deposited in floating boat-shaped masses.

Mansonia perturbans Walker.

Howard, Dyar & Knab, Monog., iii, 505, 1915.

M. ochropus Dyar & Knab is probably a rare aberration of this species, comparable to the *flaveolus* form of *titillans*. The only specimen known was taken by me near Lake Winnepesaukee, New Hampshire, in company with normal *perturbans*.

Mansonia nigricans Coquillett.

Howard, Dyar & Knab, Monog., iii, 511, 1915.

Male genitalia.—Clasp filament simple, slender, with a long terminal spine. Side piece three times as long as wide, conical, excavated at base; apex of excavation thickened, shortly produced and bearing a long spine, about half as long as the side piece. Harpes slender, curved, with two claws at tip. Unci

membranous, cylindrical, truncate; a short triangular process on each side.

Mansonia coticula Dyar & Knab.

Howard, Dyar & Knab, Monog., iii, 515, 1915.

Male genitalia.—Clasp filament simple, but enlarged at base, rather stout and thickened outwardly; a rather large terminal spine. Side piece less than three times as long as wide, conical, excavated at base; apex of excavation thickened and produced into a rod three times as long as wide, bearing a long stout inserted spine which exceeds the end of the side piece. Harpes rather slender, oblique, scarcely curved, bearing three long claws and a short one at tip. Unci stout, strongly chitinized, erect, ending in a single blunt smooth tooth; lateral margin folded over in an angle; a rather long pointed process on each side.

Mansonia fasciolatus Lynch A.

Howard, Dyar & Knab., Monog., iii, 512, 1915.

Male genitalia.—Clasp filament simple, slender, narrowed at tip, with a small inserted terminal spine. Side piece three times as long as wide, conical, excavated at base; apex of excavation thickened, shortly produced and bearing a stout spine (or two such), about a quarter as long as the side piece. Harpes slender, oblique, scarcely curved, bearing about five short teeth at the tip. Unci stout, strongly chitinized, erect, ending in two teeth directed inward and one directed outward; a rather long pointed process on each side.

Mansonia arribalzagæ Theobald.

Taniorhynchus arribálzagæ Theobald, Mon. Culic., iii, 261, 1903.

Taniorhynchus arribálzagæ Goeldi, Os Mosq. no Pará, 110, pl. G, figs. 72-74, 80; col. pl. ii, fig. 8, 1905.

Taniorhynchus arribálzagæ Theobald, Mon. Culic., v, 420, 1910.

Allied to *fasciolatus*, but with less ornamentation and a dull red mesonotum. The male genitalia have not been made known.

Mansonia juxtamansonia Peryassú.

Taniorhynchus juxta-mansonia Peryassú, Os Culic. do Brazil, 223, 1908.

Very close to *fasciolatus*, but the mesonotum with a broad central golden band instead of a narrow double golden line, while the wing-scales are somewhat broader. The male is unknown.

Mansonia albicosta Peryassú.

Taniorhynchus albicosta Peryassú, Os Culic. do Brazil, 220, 1908.

Also close to *fasciolatus*, the mesonotum as in the preceding, the wing-scales rather narrow, dark, a row of white ones on the basal fourth of the second vein. The male is unknown.

Mansonia hypocindyna, new species.

Close to *fasciolatus*, but the wing-scales black and white. Proboscis dark brown with a white ring at the middle and tip white. Mesonotum with the golden scales dividing into four narrow lines anteriorly, two on each side posteriorly, separated by a bare space. Abdomen black, with white lateral triangular segmental spots. Wings with the scales rather broad, black and white evenly mixed, the black about twice as numerous as the white; no long line of white scales at the base of the wing. Legs black, the femora pale except at tip below, a white line on the front side, with a narrow white ring near apex; tibiæ with a row of white specks below, becoming a long line and a dot on the hind pair; tarsi ringed with white on both ends of the joints, very narrowly so outwardly.

Type, Cat. No. 21720, U. S. Nat. Mus.; São Paulo, Brazil (Dr. A. Lutz).

Only the single female is before me.

A NEW PHYSOTHRIPS FROM WESTERN AFRICA
(*Thysanoptera*)

By J. DOUGLAS HOOD

Physothrips ventralis, new species.

Female (macropterous).—Length about 1.1 mm. Color blackish brown, with knees, apices of tibiæ, tarsi, and third antennal segment yellowish; ocellar and thoracic pigmentation orange-red; wings uniform dark grayish brown. *Head* about 1.3 times as wide as long, cheeks slightly rounded; interocellar bristles fully one-third the length of head. Eyes about 0.65 as long as head. Antennæ about 2.1 times as long as head, blackish brown, segment 3 grayish yellow. *Prothorax* very slightly shorter than head and 1.5 times as wide as long, transversely striate, bristles at posterior angles five-eighths the length of pronotum. Anterior vein of fore wing with 3 + 5 spines near base and two near tip. *Abdomen* without sculpture; comb on segment 8 continuous; segment 10 divided above in apical half.

Measurements: Length 1.12 mm.; head, length, 0.132 mm., width 0.149 mm.; prothorax, length, 0.128 mm., width 0.192 mm.; pterothorax, width 0.250 mm.; abdomen, width, 0.312 mm. Antennal segments: 1, 24 μ ; 2, 35 μ ; 3, 53 μ ; 4, 52 μ ; 5, 39 μ ; 6, 50 μ ; 7, 9 μ ; 8, 16 μ ; total length of antenna, 0.218 mm.; width at segment 3, 53 μ .

Male (macropterous).—Length about 0.8 mm. Sternites 3–7 each with two nearly regular transverse rows of from 5 to 9 circular pale areas. Ninth tergite without distinct armature.

Described from numerous specimens of both sexes collected from a large variety of flowers in Kamerun and at Ibadan, Southern Nigeria, in 1915 and 1916, by Lieut. Arthur W. Jobbins-Pomeroy.

The male characters separate it readily from *funtumicæ*.

Date of publication, April 10, 1918.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar and
Frederick Knab.

Subscriptions and matter for publication should be addressed to Harrison
G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the
manuscript.

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INSECUTOR INSCITIZÆ MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. VI

JULY-SEPTEMBER, 1918

Nos. 7-9



Insecutor Inscitiae Menstruus

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JULY-SEPTEMBER, 1918

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CAMERON'S AUSTRALIAN CHALCID-FLIES

By A. A. GIRAULT

Through the courtesy of Mr. Froggatt, of Sydney, I have been able to examine many of the types or cotypes of chalcid-flies described by the late Peter Cameron, as follows:

At first, it is to be regretted that, as seems to be usual, none of the types could be dissected, so that, also as seems to be usual, I am required to guess in some cases.

Chalcis froggatti.

Position correct. Hind femur laterad has a round red spot center, connected with dorsal edge which is red along distal half.

Anthrocephalus spilogaster.

Is *Stomatoceras* if the club is solid; funicle 1 quadrate, shorter than pedicel or than 2. Hind femur as in the named genus. Fore wings with a faint crescent.

A. erythrogaster.

The same genus as preceding; wings as in preceding.

Chalcis pomonae.

Has the abdomen of *Stomatoceras*; postmarginal vein longer than the stigmal; antennæ on line with eye ends; typical save abdomen and antennæ; wings hyaline, club reddish.

Anthrocephalus marginiceps.

Stomatoceroïdes most likely, funicle 1 elongate, pedicel very short and other characters agree; wings clear; ring-joint not

verified; postmarginal none, stigmal subobsolete, marginal short, thick. Male.

Xanthroeurytoma flava.

A Perilampid. Antennæ a bit above eye ends; stigmal equals postmarginal, the latter less than half the marginal, latter widening at apex; 6 subequal funicles, all wider than long; stigmal curved; axillæ meeting; scutellum large, simple. Males.

Euplectrus howardi Olliff.

Like *Tetrastichus* but abdomen with a transverse, striate petiole; latero-caudal angle of propodeum spined or acute; propodeum tricarinate, subfoveate between; sculpture ordinary for the group; funicle 1 twice longer than wide, 3 quadrate, pedicel a bit shorter than 1, club spined. One ring-joint only. From type.

Callimome reticulatus Cameron.

Appears to be *Paruriella* but hind tibiæ not examined; postmarginal somewhat longer than stigmal; description correct.

C. graminis.

Two males were present, one an *Eupelmus* (?), the other a *Paruriella*.

Podagrion spiloapteron.

Propodagrion; postmarginal longer than stigmal; scutellum polished distad of the cross-suture of punctures; petiole short; hind femoral teeth not large, more than 7.

Irichohaltichella pilosella Cameron.

A male *Stomatoceroides*, apparently, with nothing peculiar about it. Segment 2 of abdomen half the surface, striate above, antennæ filiform, the ring-joint verified. Postmarginal absent, stigmal short. Funicle 1 elongate, pedicel very short.

DESCRIPTIONS OF HITHERTO UNKNOWN
LARVÆ OF CULEX*(Diptera, Culicidæ)*

BY HARRISON G. DYAR AND HARVEY P. BARRET

Five species of *Culex* recognized from the United States are unknown in the larval state. We are able to make known one of these herewith.

***Culex peccator* Dyar & Knab.**

Head broad and transverse, bulging on the sides, marked with black in a large patch on the posterior angle and a smaller patch before antenna. Antennæ large, slightly swollen on the basal two-thirds, the apical third narrower, a large multiple tuft at the notch; two of the terminal setæ very long; basal two-thirds white, stained with brown at base, outer portion brown. The antennæ when projected forward are considerably longer than the head, distinctly spinose. Head hairs, upper a small tuft of about eight, fine and short; lower long, single, stout; anteantennal tuft multiple, coarse and feathered. Skin of the body distinctly pilose. Lateral comb of the eighth segment of about 14 scales in a double row, becoming single below, the single scale pointed, thorn-like, not feathered. Air-tube straight, tapering toward base, about six times as long as wide, glabrous; pecten of about 12 teeth on basal third of tube, followed by five paired tufts in a straight line, multiple and diminishing somewhat in length outwardly; tube slightly flared at the tip. Anal segment longer than wide, pilose, ringed by the plate. Anal gills moderate, about as long as the segment.

The larvæ were found beneath the overhanging bank of a stream at the head of an artificial lake, also in small pools in marshy ground at the head of the lake. At this point there was very little perceptible current in midstream and practically no current at the edge. The banks were jagged and afforded many small harbors for lodgment of the larvæ. The larvæ were present in only fairly large numbers and were associated with *C. saxatilis* Grossb. Superficially they resemble *C. saxa-*

tilis, though darker in color, and presenting rather conspicuous white bands at the base of the antennæ.

Taken at Charlotte, N. C., August, 1917.

***Culex floridanus* Dyar & Knab.**

The northernmost record of this species heretofore is Georgia. A few larvæ were found in a temporary rain pool along a newly made street. The larvæ were rather scarce as only one was found at the first visit to this locality and four more a month later. Their scarcity may have been in part due to the presence of predacious larvæ in the same pool. The larvæ were greyish in color and were rather small. They resembled, somewhat, *Psorophora discolor*, with which they were found, and had the same habit of lying inverted at the bottom of the pool. Two specimens were bred to maturity.

Taken at Charlotte, N. C., July and August, 1915.

NEW AMERICAN MOSQUITOES

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

***Wyeomyia aphobema*, new species.**

Male. Proboscis long, downcurved at the apical third and swollen at the tip, clothed with black scales; palpi about one-eighth the length of the proboscis, black; clypeus and tori nude; antennæ with the last two joints elongate and thickened, with short hairs, the others white at their tips and with basal whorls of long cilia; eyes broadly contiguous at the vertex, but separated in front by a narrow wedge of integument; occiput clothed with black scales with a bluish luster, a white margin on the sides below. Prothoracic lobes collar-like, clothed with dark shining blue scales, showing a violet reflection. Mesonotum with large dark brown scales. Postnotum nude. Abdomen blackish brown above, white below, the colors separated on the sides in a nearly straight line. Legs long and slender, the front femora as long as the middle ones, hind femora shorter; hind tibiæ slightly swollen at tip; coloration bronzy

blackish; mid tarsi silvery white below on most of the second and all of the third to fifth joints; front tarsi with a whitish reflection beneath; hind tarsi dark. Wings faintly smoky, the scales dark, rather broadly ligulate outwardly.

Genitalia: Side pieces broadly conical, not longer than wide, each bearing near the base a tuft of long, thick, pointed spines, which extend beyond the end of the side-piece; clasp-filament long, slender, simple, being only a little swollen outwardly and with a few scattered setæ; three short terminal spines. Basal structures reduced, invisible. Basal appendages with foliate plates.

Type, male, No. 21915, U. S. Nat. Mus.; Lawa River, Surinam, the larvæ found in Bromeliaceæ, March, 1917 (Mrs. J. Bonne-Wepster).

This species is provisionally placed in *Wycomyia*, probably requiring a new genus. It would fall in *Sabethinus* by the monograph tables, but seems out of place there. The peculiar genitalia, totally unlike those of any other Sabethid known to me, suggest those of *Uranotaenia*.

Culex (Culex) surinamensis, new species.

Proboscis showing a broad pale band below in the female, white-ringed in the male; occiput with brown scales, the eyes margined with white; mesonotum with narrow curved dark golden brown scales; abdomen black, with broad basal segmental white bands in both sexes; venter with black apical bands. Legs black, the femora pale below, the tibiæ white-lined on the under side nearly to apex; tarsi with moderate white rings at both ends of the joints, the last joint like the others.

Types, No. 21912, U. S. Nat. Mus.; Marowyne and Lawa Rivers, Surinam, bred from larvæ in a rock pool and in a water barrel, March, 1917 (Mrs. J. Bonne-Wepster).

The adult has the coloration of *coronator* D. & K. and *ousqua* Dyar. The definition is by the male genitalia, which are as in *coronator*, except that the outer tooth of the second uncal plate is small and rounded, like a little thumb, instead of

long, slender and sharply angled, as it is in both *coronator* and *ousqua*.

The larva, also, differs markedly from that of *coronator*, having a comparatively stout and uniform air-tube without trace of the crown of subapical spines.

Culex (Culex) usquatus, new species.

Proboscis showing a broad pale band below in the female, white ringed in the male; occiput with brown scales, the eyes margined with white; mesonotum with narrow curved dark golden brown scales; abdomen black, with broad basal segmental white bands in both sexes; venter with traces of blackish apical bands. Legs black, the femora pale below, the tibiæ white-lined on the under side; tarsi with small white rings at both ends of the joints, the last joint with the tip black.

Types, No. 21913, U. S. Nat. Mus.; two males and three females, "many larvæ found in old boats, in a fallen, nearly burned tree, in very dirty puddles, in water barrels, sometimes *Lutsia allostigma* preying upon them. Only once found far from human habitations; in all other cases the breeding-places were near houses. February, 1917. Marowyne and Lawa Rivers. Also, February, 1918. Surinam River" (Mrs. J. Bonne-Wepster).

The adult has the coloration of *coronator* D. & K., *ousqua* Dyar and *surinamensis*, described above. The definition is by the male genitalia, which have the upper tooth of the second uncal plate a small straight blade, pointed, but not bent; the lobe of the side-piece is scarcely divided, having outwardly a group of five spines, inwardly the three usual rods, but supplemented basally by a stout spine and a seta; the tip of the side-piece bears a dense group of about eight stout setæ, situated upon a rounded prominence.

The larva has a long slender air-tube with two or three spines subapically, much as in *ousqua*.

Culex (Melanoconion) zeteci, new species.

Male. Palpi longer than the proboscis, the last two joints hairy; legs with the femora whitish below and with distinct

knee-spots, the tips of the tibiae also whitish; tarsi black, unbanded. Integument of the thorax brown, of the abdomen gray, with the tips of the segments blackish, distinctly lighter than in *Culex educator* and *C. hesitator*. The specimen is of about the size of these species or slightly larger, comparable with the smallest males of *C. quinquefasciatus*. The specimen is completely denuded of scales.

Genitalia. Clasp filament long, narrowed outwardly, sinuate on the apical third but not enlarged at tip (possibly it is elliptically enlarged at tip with a strong central groove, the part below the groove membranous. The mount is not very clear. If this is the case, the species may be placed in *Charoporpa*). Side-pieces three times as long as wide, excavated on the basal two-thirds within; subapical process divided, the outer limb bearing an elliptical leaf bent to one side, closely accompanied by about five fine setae, not as long as the leaf; inner limb stouter than the outer, with a large flattened filament with spoon-shaped tip and a second filament inserted on the basal third of the limb. Harpes comb-shaped with about eight strong teeth. Unci divided, the plates all flat, none hook-like; first plate narrowly triangular, dark brown; second plate elongate, reaching the middle of the side-piece, triangular, membranous, with a sharp pointed brown tip; third plate long, membranous, columnar, the tip curved over and rounded; lateral plates double, a large triangular dark brown outer one covering a narrowly triangular, roundedly pointed membranous inner one.

Type, male, No. 21778, U. S. Nat. Mus.; Gatun, Canal Zone. Panama, January 16, 1913 (J. Zetek).

***Culex (Melanoconion) dunni*, new species.**

Head with a broad area of narrow curved scales behind, largely pale and mixed with upright forked black ones; an area of flat white scales on the sides, running up along the margins of the eyes, but not reaching vertex. Mesonotum pale brown, longitudinally lined with darker brown, clothed with narrow curved bronzy brown scales and long black bristles. Abdomen black dorsally in the female with lateral whitish

basal segmental spots; showing white basal bands in the male after the second segment; venter whitish, the segments apically banded with black. Legs bronzy black, knee-spots and tips of tibiæ narrowly whitish; femora pale beneath. Wing scales brown, ovate, spinose along costal edge.

Male genitalia. Clasp filament simple, constricted at basal third, the spine subterminal, widened and appendiculate; side-piece about twice as long as wide, conical, excavate at the base; lobe divided, a basal portion nearly sessile consisting of four spines, one stouter and on a more elevated pedicel; outer division pedicellate, of four short spines and a large leaf-like appendage. Harpes long-stemmed, comb-shaped, with 8 or 9 teeth. Unci with the basal plate slender and recurved into a pair of hooks; two pairs of slender upright plates, the central one denticulate; sublateral plate very large, bifid, the inner arm forming a large horn-like plate, the outer one finger-shaped and sinuate.

Types, No. 21714, U. S. Nat. Mus.; male and female, Mandingo River, Panama, bred from larvæ associated with *Pistia* (L. H. Dunn).

Culex (Choeroporpa) tecmarsis, new species.

Head with a narrow area of small scales in the nape, not reaching the vertex, the remaining scales broad and flat, black and white, the white predominating. Mesonotum pale brown, with darker longitudinal linings, clothed with dense narrow curved bronzy brown scales and black bristles, the general effect dark brown. Abdomen black dorsally in both sexes; lateral spots faint, pale, alike in both sexes; venter pale, very broadly banded with black at the apices of the segments. Integument of pleura and leg-bases dark brown; legs black, the femora paler beneath, but still of a brown tint. Wing scales dark brown, ovate, only the outstanding ones on base of third vein ligulate.

Male genitalia. Clasp filament narrowly snout-shaped, the tip distinct and upturned, the spine widened and appendiculate; eye-shaped insertion of the seta proportionately large; dorsal aspect finely pilose. Side-pieces twice as long as wide,

swollen, tending to be spherical, excavate at base; lobe divided, the inner portion with two long distorted rods with spoon-shaped tips, one inserted beyond the other; outer portion bearing four filamentous curved rods and a long-stemmed transversely elliptical leaf-shaped appendage. Harpes comb-shaped with nine teeth. Unci with the first plate narrowed and hook-like but not very slender nor long; second plate stout, concave, bifid and widened at tip without accompanying hooks; sublateral plate broad, with a finger-shaped process on the outer angle. Basal lobes long, reaching to middle of side-piece, the setæ forming a dense tuft at tip.

Types, No. 21715, U. S. Nat. Mus.; two males and a female, Trinidad River, Panama, males, June 9, 1912, female, May 5, 1911, taken at light (A. Busck).

Culex (**Helcoporpa**, new subgenus) **menytes**, new species.

Head with narrow curved whitish scales over the nape and vertex, broad white ones low on the sides; many erect black forked scales. Mesonotum brown, longitudinally lined with darker brown, clothed with narrow curved bronzy brown scales and brown bristles. Abdomen entirely black, bronzy above, dull on the venter. Legs bronzy brown, the coxæ and the femora below pale. Wing scales dark brown, ovate, spinose along costal edge.

Male genitalia. Clasp filament attenuated at outer third, the tip obliquely elliptically excavate, hollowed, a curved spine at the tip; dorsal margin minutely hirsute. Side-piece swollen, about twice as long as wide, excavate at base; lobe divided, the inner part with one large sinuate filamentous appendage and a small rod; the other with an elliptical flattened appendage with incised hooked tip, a fan-shaped leaf obliquely terminated and two small setæ. Harpes comb-shaped, the tips recurved in the shape of a hook, about 12 teeth, somewhat spreading and not closely set. Basal plate of the unci trigonate, not hooked; second plate short, ill-defined; third plate with laterally projecting tooth; sublateral plate not strongly developed. Basal lobes conical, large but not long.

Type, No. 21716, U. S. Nat. Mus.; male, Trinidad River, Panama, March 20, 1912 (A. Busck).

The new subgenus is founded on the male genitalia, which differ from *Chocroporpa* in the elliptical sucker-like termination of the clasp filament. The last plate of the unci ends in a sharp tooth, recalling *Microculax*; but the point is laterally directed, not retrose.

Culex (Mochlostyrax) alogistus, new species.

Bronzy black. Occiput clothed with flat broad white scales, only a few black ones present; mesonotum dark brown, the scales small, sparse and bronzy brown; abdomen black above, bronzy shaded, with lateral, basal segmental white spots in both sexes; legs black, the femora white below; wing-scales black, those on the second to fourth veins ovate. A small, dark species with white head.

Types, No. 21914, U. S. Nat. Mus., four males and one female; bred from larvæ in temporary pools, lying on their backs on the bottom, Surinam (Mrs. J. Bonne-Wepster).

The male genitalia are distinctive; characters in general of *hesitator* D. & K., but the basal lobes of the penultimate segment enormously developed, bearing long hairs that reach to the tips of the side-pieces.

The larvæ have typical *Mochlostyrax* structure.

Psorophora (Psorophora) ctites, new species.

Entirely as in *P. ciliata* Fab., except for the absence of the raised scales on the legs, palpi and base of proboscis. Head with median bare space, the scales flat and white; bristles yellowish; some erect slender black scales behind. Mesonotum with a median line of golden yellow scales, subdorsal area nude; lateral areas with flat white scales. Abdomen wholly gray-scaled posteriorly, with lateral areas of blackish scales in front; venter with sparse gray scales. Legs black-scaled, the scales appressed, none broadly spatulated or erected; femora pale beneath; tarsi with white rings at the bases of the joints, becoming smaller outwardly, the fifth joint not ringed. Wings

smoky hyaline, the costal half distinctly infuscated; scales ligulate, brown.

Types, No. 21117, U. S. Nat. Mus., three females, Brownsville, Texas, August 28, 1916 (M. M. High). A single male is too much rubbed to be certain of the association. *P. ciliata* occurs also at Brownsville. It is recorded in the monograph¹ but, although the particular specimen has disappeared from the collection, I have another, taken by Mr. M. M. High.

***Psorophora (Janthinosoma) texanum* Dyar & Knab.**

Many specimens were collected by Mr. M. M. High in Brownsville, Texas, including a number of males. The genitalia do not differ from those of *toltecum*, as figured in the monograph¹ (vol. II, plate 22, fig. 155, 1912). The male genitalia were not previously observed (Monograph, vol. IV, p. 529, 1917), and are accordingly made known, although not showing special diagnostic characters.

***Aedes (Ochlerotatus) eucephalæus*, new species.**

Head clothed with silvery white scales, only a small patch of black ones on each side; mesonotum with dark bronzy brown scales, a narrow stripe of silvery ones from the anterior edge to antescutellar space. Abdomen black above, with large lateral segmental basal silvery white spots, the venter white with traces of apical dark bands. Legs black, the femora pale beneath.

Close to *serratus* Theobald, but much smaller and with more white on the head.

Male genitalia. Side-pieces conical, about three times as long as wide, the clasp-filament long with long terminal spine; apical lobe minute, nude; basal lobe with a spine detached on one side, the head rounded-capitate with many short curved setæ. Harpes small, concave, with curved tips. Harpagones with moderately long slender stem, the filament short, small, sickle-shaped. Unci small, revolute, conical. Basal appendages with four spines.

¹ Howard, Dyar & Knab, Mosq. of North & Cent. Am. & W. I., 1912-1917.

The larva falls with *serratus*, but has less teeth in the lateral comb of the eighth segment, namely about seven instead of the ten or more in *serratus*. The anal gills are large and conspicuously tracheate.

Types, No. 21911, U. S. Nat. Mus., three males and two females, bred from larvæ lying on their backs on the bottom of temporary rainpools in sandy land, Surinam, March 12 to 20, 1918 (Mrs. J. Bonne-Wepster).

***Aëdes (Ochlerotatus) nubilus* Theobald.**

Culex nubilus Theobald, Mon. Culic., iii, 208, 1903. (♀)

Aëdes polyagrus Dyar, Ins. Ins. Mens., vi, 77, note, 1918. (♂)

Mrs. Bonne-Wepster sends bred specimens from identical larvæ, the males with a silvery median mesonotal stripe, the females entirely without this marked ornamentation. The species is therefore sexually dimorphic.

***Aëdes (Ochlerotatus) camposanus*, new species.**

Female. Proboscis black-scaled. Occiput with flat white scales, the erect forked scales on the nape brown, and giving a brown shade to the posterior portion of the head. Mesonotum with silvery white scales in a broad patch over the anterior two-thirds, the anterior margin and posterior third golden brown; a yellow streak before the antescutellar space. Rarely this white patch is golden yellow. Abdomen black above, with lateral triangular basal segmental silvery white spots; venter white with traces of apical segmental black bands. In some specimens there are basal median white spots dorsally, which form a continuous line on the last three segments. Femora white, their tips black; tibiæ black with a broad white line on the under side, not reaching base or apex, most distinct on the hind pair; tarsi black, with a white reflection below, most distinct on the first joint. Claws toothed. Wing-scales wholly dark.

Male. Coloration as in the female. Genitalia with the side-pieces long and slender, about four times as long as wide, conical; apical lobe rather small, nude; basal lobe small, rounded with few short hairs, a very stout spine on its margin.

Harpagones nearly half as long as the side-piece, the apical filament long, slenderly sickle-shaped or a little expanded in the middle. Harpes concave with revolute margins. Unci conical. Basal appendages short and stout, with four setæ on the tip and one at the side. Clasp filament simple with long terminal spine.

Types, male and female, No. 21916, U. S. Nat. Mus. Also 52 other specimens, Guayaquil, Ecuador (F. Campos R.).

Allied to *A. scapularis* Rondani, but the male genitalia without a retrose spine on the filament of the harpago.

Named in honor of the collector, Prof. F. Campos Ribadeneira.

Aëdes (Taeniorhynchus?) thelcter, new species.

Head and mesonotum with dense narrow curved golden yellow scales. Abdomen black, with median segmental patches of yellowish white scales, forming large triangular basal spots, on the first segment almost reaching apex; similarly colored lateral patches, larger, leaving only a small space at apices of segments black; venter entirely pale yellowish scaled. Wing scales black, narrow. Legs, femora pale below, tibiæ brownish, tarsi black. Claws toothed.

Type, No. 21718, U. S. Nat. Mus., female, Brownsville, Texas, August 29, 1916 (M. M. High). Thirty-two other females are before me from the same collector, but all in poor condition. If this species belongs in the subgenus *Taeniorhynchus*, as surmised, the larvæ may be found in rock-holes along the river; but the species may belong in *Ochlerotatus*. In the absence of a male, I do not feel certain.

NEW MOTHS FROM MEXICO AND CUBA

(Lepidoptera)

By HARRISON G. DYAR

Family NOCTUIDÆ

Subfamily HADENINÆ

Hyssia umbera, new species.

Male antennæ minutely fasciculate. Head and thorax blackish brown; abdomen light brown, the anal tufts ocher. Fore wing broad, obscure dark brown, the lines faintly shown; base darker shaded, bounded by a black inner line, which forms an outward arc below median vein; reniform upright, narrow, constricted, outlined in black, followed by a rounded lighter area; outer line pale, denticulate, excurved over cell; subterminal line dark, clouded, showing as spottings opposite cell and in submedian interspace; fringe with black basal line, a little touched with ocherous at the ends of the veins. Hind wing fuscous shaded, lighter on the disk and touched with ocherous at base on inner margin and at the ends of the veins; a black terminal line. Expanse, 37 mm.

Type, male, No. 21725, U. S. Nat. Mus.; Zacualpan, Mexico, July, 1917 (R. Müller).

Hydroeciodes mormon, new species.

Head, thorax and abdomen dark brown; anal tuft pale, with a little purple intermixed. Fore wing with ground ocher flecked with orange, but showing only in the stigmata and subterminally; dark brown; lines slender, blackish; inner cutting the ocher claviform area straightly, angled on vein 1; outer half of claviform with a longitudinal line; orbicular round, ocher, orange-centered; reniform ocher spotted on upper inner corner and outer center; an oblique white spot on lower inner corner, its point between the two lower outer spots; five rounded white outer spots; outer line dentate on the veins; space beyond spotted with orange-ocher before and beyond the clouded subterminal line; terminal space dark. Hind wing ocherous on the disk, veins, discal mark and outer area blackish

shaded; a dark terminal line; fringe with some reddish. Expanse, 31 mm. Male antennæ lengthily bipectinated on basal three-fourths.

Type, male, No. 21726, U. S. Nat. Mus.; Zacualpan, Mexico, January, 1917 (R. Müller).

Hydroeciodes impica, new species.

Head and thorax dark brown intermixed with reddish; abdomen black above, sides, venter and anal segment light purplish. Fore wing dark ocher, densely irrorate with red-brown; median space blackish shaded; terminal space solidly dark brown; inner line dark brown, obscure, forming three arcs; orbicular and claviform obscure, light, large and rounded but not contrasted; a blackish median shade-line, bent in cell; orbicular large, rounded, ocher and reddish, containing a curved red bar, the marginal spots yellow, confluent, except at lower inner and outer corners and upper outer corner; outer line dentate on the veins, dark, narrow, not contrasted; inner edge of terminal space waved. Hind wing soiled whitish, veins and terminal line dark brown; fringe faintly reddish. Expanse, 33 mm.

Type, female, No. 21727, U. S. Nat. Mus.; Zacualpan, Mexico, December, 1917 (R. Müller).

Hydroeciodes traversa, new species.

Head and thorax orange and dark ocher, the patagia fringed with brown; abdomen brown with purplish tint, the basal tuft blackish. Male antennæ minutely ciliate. Fore wing red-brown, irrorate with ocher; costal edge and outer half of inner margin brown; inner line brown, of three arcs; claviform absent; orbicular large, round yellowish, outlined in brown; a straight median dark brown shade-line; reniform full, outlined in brown, two spots on inner side and four on outer yellow; veins terminally brown-lined; outer line excurved above, a little dentate on the veins; terminal space dark-filled, cut by the darker veins; fringe dark. Hind wing reddish in the male, fuscous shaded in the female, the fringe light. Expanse, 28 mm.

Type, female, allotype, male, No. 21728, U. S. Nat. Mus.; female, Orizaba, Mexico, October, 1907 (R. Müller); male, Jalapa, Mexico (Schaus collection), labelled *H. asteca* Schaus, from which it differs in its smaller size, redder color and absence of the claviform.

Subfamily CUCULLIINÆ

Rhizotype cristifer, new species.

Prothorax with a long, divided, pencil-like crest. Body parts dark gray. Fore wing with the apex sharp, outer margin straight to vein 4, then rounded. Dark brownish gray; reniform and orbicular large, contiguous, outlined by white scales, darker filled; an obscure dark shade line obliquely from reniform to inner margin; outer line sinuate, smooth, dark, edged with gray without, faint; subterminal line a sinuate row of pale spots; a dentate whitish terminal line. Hind wing dark fuscous, paler at base; an ill-defined discal mark and traces of a dark band just beyond it. Expanse, 22 mm.

Type, male, No. 21729, U. S. Nat. Mus.; Zacualpan, Mexico, October, 1917 (R. Müller).

Rhizotype senescens, new species.

Warm brown, many scales white-tipped. Fore wing warm brown, basal, median and terminal spaces shaded with dark brown; lines picked out in white scales; subbasal line arcuate; inner line more strongly curved, only partly traced; outer line somewhat sinuate; orbicular and reniform large, separate, white ringed, filled with concolorous ground; subterminal space light, the veins darker, with a row of white specks on them just beyond outer line; subterminal line a row of whitish spots on the interspaces; a terminal crenulate white line forming spots on the veins, incompletely traced elsewhere. Hind wing fuscous brown, a little ochereous at base; discal mark dark and traces of a line beyond it. Expanse, 28 mm.

Type, female, No. 21730, U. S. Nat. Mus.; Tehuacan, Mexico, October, 1917 (R. Müller).

Subfamily ACRONYCTINÆ

Micromonodes endotherma, new species.

Head and collar with flat ocherous scales; thorax and abdomen violaceous brown. Fore wing violaceous brown; a narrow curved brown line from middle of costa to outer third of inner margin, preceded on the inner margin by a large brownish ocher patch with a purplish dash inwardly; beyond this line, a whitish line, somewhat dislocated at the location of the obsolete reniform, which is stained with yellowish; a purplish apical patch, with a broken brown dash below it, the inner segment with an ocherous mark below; terminal line blackish, submacular, followed by a fine ocherous line. Hind wing dark fuscous, paler at base; fringe pale, interlined. Expanse, 16 mm.

Type, female, No. 21131, U. S. Nat. Mus.; Misantla, Mexico, July, 1914 (R. Müller).

Calymnia cinetes, new species.

Head and thorax dark red, intermixed with white; abdomen purplish gray. Fore wing with the outer margin excavated from apex to vein 4, oblique below, slightly crenulate; blackish brown, a dark red suffusion through submedian and discal interspaces and between all the veins subterminally; lines white, slender, the inner a little curved and outwardly oblique, the outer excurved over cell; reniform a blurred white ringlet at the origin of vein 4 and two dots at the base of vein 6. Hind wing dark fuscous brown, the fringe purplish; discal mark and median line darker. Expanse, 29 mm.

Type, female, No. 21132, U. S. Nat. Mus.; Zacualpan, Mexico, October, 1915 (R. Müller).

Stiria phalaenoides, new species.

Head brown on the front, creamy white on vertex; thorax white, a little gray tinted behind; abdomen ocherous tinted. Fore wing creamy white, grayish irrorate on inner half; costa narrowly ocher-brown; lines ocher-brown, partly gray; inner line angled on submedian fold; outer sharply angled on vein 8,

straight and oblique below; a faint narrow curved discal mark. Hind wing ochereous whitish, lightly shaded with fuscous. Expanse, 26 mm.

Type, male, No. 21733, U. S. Nat. Mus.; Zacualpan, Mexico, September, 1917 (R. Müller).

A small frail species, resembling *S. argyropolia* Dyar.

Family NOTODONTIDÆ

Dicentria moribunda, new species.

Head and thorax blackish brown, patagia intermixed with wood-brown; abdomen dark gray, blackish outwardly, with a slender whitish line on the penultimate segment. Fore wing dark purplish brown; a broad pale wood-brown ray through cell ending in a point before termen, enclosing a round black discal dot; a fainter parallel shade below reaching margin at vein 4; a white terminal spot in interspace 2-3; lines obscured, the outer visible below, geminate, dark, denticulate; fringe spotted black and whitish. Hind wing slightly ochereous white, the veins darker; a gray spot at anal angle. Expanse, 38 mm.

Type, male, No. 21734, U. S. Nat. Mus.; Zacualpan, Mexico, July, 1917 (R. Müller).

Near *D. disparilis* Schaus, but larger and broader winged, the pale discal ray completely enclosing the discal dot.

Family EUPTEROTIDÆ

Apatelodes gladys, new species.

Dark umber brown. Fore wing with two parallel outer lines, excurved on upper fourth; an oblique line from basal fourth of costa running out along vein 2; dark irregular shadings along inner margin, intensified and cut by a whitish dash at basal third; a single small whitish subapical dot. Hind wing reddish brown; a single mesial line, angled subapically, with a dark brown mark on inner margin. Expanse, 37 mm.

Type, male, No. 21735, U. S. Nat. Mus.; Zacualpan, Mexico, July, 1915 (R. Müller).

Near *A. batima* Dyar, the fore wing brown, not gray, the hind wing not dark red.

Apatelodes sadisma, new species.

Brown, the fore wing with a slight mottled appearance, showing especially in a wavy whitish subterminal shade; two outer parallel lines, the inner wavy and crenulate, the outer resolved into dots; traces of an oblique line from base of costa to vein 2; mark at basal third of inner margin an erect whitish line, preceded by a brown patch and followed by a dark duplication; subapical dots two, white, the lower the larger, preceded by brown. Hind wing warm reddish brown with inner brown shaded line and outer narrow crenulate blackish one. Expanse, 37 mm.

The female is strongly mottled with whitish, forming an ovate discal patch, beyond which a brown shade-line crosses the wing. Expanse, 44 mm.

Type, male, allotype, female, No. 21736, U. S. Nat. Mus.; Misantla, Mexico, June, 1915 (R. Müller).

Family GEOMETRIDÆ

Subfamily GEOMETRINÆ

Apicia remorta, new species.

Brownish straw-color; lines slender, brown; inner line of fore wing bent at right angles on median vein, a little wavy; outer line straight to vein 7, faintly reflexed, brown within, yellowish without; wing surface smooth, not conspicuously irrorate. Hind wing with a single line from inner margin to vein 6. A round dark discal dot on each wing. Expanse, 31 mm.

Type, male, No. 21737, U. S. Nat. Mus.; Zacualpan, Mexico, June, 1915 (R. Müller).

Ira medullata, new species.

Brownish ocherous; fore wing with a large costo-subapical patch of lilaceous, edged with black and dentate on the outer side; inner line red-brown, faint, marked with purple on costa; discal dot small, round, purple; outer line red-brown, straight to the costal patch. Hind wing of the same color, a single straight outer line to vein 6, marked with purple below vein 2;

outer half of wing a shade darker than inner half; a small round discal dot. Expanse, 37 mm. Male antennæ with long pectinations except at the tips.

Type, male, No. 21738, U. S. Nat. Mus.; Zacualpan, Mexico, August, 1914 (R. Müller).

***Therina negata*, new species.**

Wings thin, light brown, irrorate with ocher and purple scales; lines indicated by purple dots on the veins, followed by ocher; discal dot a trace. Hind wing similar, with single mesial line of dots. Expanse, 33 mm.

Type, male, No. 21739, U. S. Nat. Mus.; Zacualpan, Mexico, October, 1917 (R. Müller).

Subfamily ACIDALIINÆ

***Semaepus concatenans*, new species.**

Dull ocher, irrorate with purplish; fore wing with three lines, hind wing with two, pale purplish, wavy and denticulate; discal dots on both wings moderate, rounded, of black and purple scales. Expanse, 26 mm.

Type, male, No. 21740, U. S. Nat. Mus.; Zacualpan, Mexico, October, 1917 (R. Müller).

Near *S. citrina* Druce, slenderer, less yellow, the lines thicker although not darker.

***Semaepus discosa*, new species.**

Dark ocher, the wings finely irrorate with purplish; lines distinct, dull purplish, wavy and denticulate; discal spots of both wings large, round, dull purple irrorated with lilaceous, followed each by a purplish cloud that fills in the bend of the median line. Expanse, 29 mm.

Type, male, No. 21741, U. S. Nat. Mus.; Zacualpan, Mexico, October, 1917 (R. Müller).

This may be a heavily marked variety of *S. citrina* Druce.

Subfamily LARENTIINÆ

***Mesoleuca platymesa*, new species.**

Head, thorax and base of abdomen blackish, the rest of abdomen white; wings white, the basal fourth of fore wing

blackish, irrorate with lilaceous and crossed by a faint double whitish line; a black discal dot and faint markings along costa; terminal space filled in with brown and blackish, edged by an irregular black line within, bisected by a wavy white subterminal line and marked by a white patch on margin at veins 3-4; a terminal row of black dashes. Hind wing with a black spot at extreme base. Expanse, 17 mm.

Type, male, No. 21742, U. S. Nat. Mus.; Zacualpan, Mexico (R. Müller).

Tephroclystia subanis, new species.

Blackish gray; fore wing with three broad pale gray bands, the inner bordering the dark basal space and dark-edged on its upper half; mesial centered by a row of dots, gray-edged within and with a blackish border without as broad as the band itself, angled subcostally; outer band angled subcostally and on submedian fold, with a faint crenulate dark line beyond; subterminal line crenulate, whitish, close to the margin. Hind wing dark below median vein with two narrow inner pale bands and a broad outer one, the markings obliterated above the cell; discal dot small, round, dark. Expanse, 15 mm.

Type, female, No. 21743, U. S. Nat. Mus.; Zacualpan, Mexico, July, 1915 (R. Müller).

Resembles *T. pieria* Druce, although very different in detail.

Family ZYGAENIDÆ

Gingla mas, new species.

Head black, collar and thorax brownish ocher, abdomen black; wings translucent black, the disk of hind wings a little paler. Fore wings with veins 2-11 from the cell and separate. Expanse, 26 mm.

Type, male, No. 21744, U. S. Nat. Mus.; Zacualpan, Mexico, July, 1913 (R. Müller).

Appearance of *G. thyesta* Druce, but the thorax less red and with different venation. This may be the male of *G. raconica* Dyar, but it seems much too large.

Family PYRALIDÆ

Subfamily PYRAUSTINÆ

Pionea cacidus, new species.

Fore wing with ground color pale straw-color, heavily overlaid with brown irrorations, the costa and terminal spaces solidly dark; lines very faint, dark, pale-edged, dentate, the outer broadly excurved over cell; a terminal dark line, followed by yellowish dots at the ends of the veins; fringe dark gray, uniform. Hind wing pale fuscous; fringe as on fore wing, the terminal yellow dots forming a line. Expanse, 20 mm.

Type, male, No. 21745, U. S. Nat. Mus.; Mexico City, Mexico, August, 1917 (R. Müller).

Pyrausta euchromistes, new species.

Fore wing yellow, the terminal space solidly pink with a straight inner edge; a pink shade on costal half of wing to two-thirds, diffused below. Hind wing creamy whitish, with a pale fuscous line on outer area, straight from anal angle to vein 7 before apex; orbicular and reniform lost in the general suffusion in the female, distinct in the male, in which the suffusion is less marked. Expanse, 20 mm.

Type, female, allotype, male, No. 21746, U. S. Nat. Mus.; Mexico City, Mexico, September and October, 1914 (R. Müller).

Subfamily PHYCITINÆ

✓ **Eucardinia**, new genus.

Fore wing with veins 2 and 3 separate, 4 and 5 approximated at origin but not stalked, 6 from below the apex of the cell, 7-9 stalked, 9 absent, 10 and 11 from the cell. Hind wing with the cell about one-third the length of wing, 2 from before the end, 3 continuing the end of the cell, 4-5 long-stalked, 6 from apex of cell, 7 and 8 anastomosing. Labial palpi strongly upturned, much exceeding the vertex, fringed with scales in front, more strongly so in the male; front circularly flat and nearly deprived of scales. Antennæ of the male with a rounded prominence on the upper side bearing black teeth

at its tip; basal part of shaft thickened and flattened, with two ridges of black scales, the posterior one the larger, not bent. Vertex lightly scaled; collar with large overlapping black scales. Tongue distinct. Wings without a scale ridge.

Named in honor of Sr. Patricio Cardin.

Eucardinia caricae, new species.¹

Fore wing gray, shaded with whitish on inner line and obliquely across discal mark; costal part of basal space dark, nearly black in the male and with spottings of this color across the space; inner line oblique, dark, slender, angled a little on submedian fold, preceded by whitish and followed by ocher, these light shades again narrowly dark-bordered; inner half of median space with a dark shade, wide on costa, running in on inner margin to inner line; discal dots conjoined, lunate; outer line indented subcostally, a little excurved below, dentate, the venules dark-marked, followed by a narrow pale ocherous line; a dark terminal patch at apex; terminal black dots joined into a line. Hind wing whitish, the apex fuscous, more broadly so in the female; a terminal dark line and faint interline in the fringe. Expanse, 13–14 mm.

Type, male, paratypes, 6 males and 10 females, No. 21752, U. S. Nat. Mus.; Santiago, Cuba, June, 1902 (W. Schaus); Est. Cent. Agr. de Cuba, Santiago de las Vegas, Cuba, February 25, 1916, from larvæ on fruit and stem of *Carica papaya* (P. Cardin).

Laetilia cardini, new species.

Fore wing dark gray, overspread with reddish on the inner half except terminally; center of costa marked with white; lines whitish, upright, the outer only a little excurved mesially; a black submedian line at base, discal dots conjoined, blackish; terminal dots slight. Hind wing fuscous, paler at base. Expanse, 13 mm.

¹This is the same species described by me from Florida as *Ulophora caricae* (Proc. Ent. Soc. Wash., xiv, 218, 1913). The apparent scale-ridge, causing the reference to *Ulophora*, exists only in the male, and even there is scarcely a ridge, the scales being disturbed in the single male type. I repeat the specific name in order to get a type number for the new genus.

Type, female, No. 21753, U. S. Nat. Mus.; Est. Cent. Agr. de Cuba, Santiago de las Vegas, Cuba (P. Cardin).

Similar to *L. portoricensis* Dyar, but without dark spot in the white patch on costa.

Named in honor of Sr. Patricio Cardin.

✓ ***Laetilia obscura*, new species.**

Dark brown-gray; inner line whitish, straight, faint, preceded by darker scales; costal region a little lighter; discal dots fused; outer line only a trace. Hind wing dark fuscous, translucent at base. Expanse, 9 mm.

Type, female, paratypes, three males and two females, No. 21754, U. S. Nat. Mus.; Est. Cent. Agr. de Cuba, Santiago de las Vegas, Cuba (P. Cardin).

✧ ***Ephestia patriciella*, new species.**

Fore wing dark blackish gray, shaded with brown-red, especially through the center and between the veins, which thus appear black-lined outwardly; ordinary markings obsolete. Hind wing translucent whitish, the costa narrowly, veins outwardly and a terminal line dark fuscous. Expanse, 12 mm.

Type, female, No. 21773, U. S. Nat. Mus.; Baracoa, Cuba, October, 1902 (W. Schaus); paratypes, female, Santiago, Cuba, May, 1902 (W. Schaus), three males, Est. Cent. Agr. de Cuba, Santiago de Las Vegas, Cuba (P. Cardin).

Named in honor of Sr. Patricio Cardin.

BROMELICOLUS ANOPHELES—A CORRECTION

(*Diptera, Culicidæ*)

BY HARRISON G. DYAR AND FREDERICK KNAB

The so-called genera of *Anopheles* proposed by Theobald as founded on scale-characters are obviously inadmissible as genera, but they may be used in a subgeneric sense to assist in the classification. In going over them in this sense, it appears that the identification of *Kertessia boliviensis* Theobald made by the junior author (Ins. Ins. Mens., i, 17, 1913) as being the

same as *Anopheles lutzii* Theobald (not Cruz) = *A. cruzii* Dyar & Knab, is in error. *Kerteszia* is described as possessing scales on the abdomen, which is not the case with *cruzii*. This correction will have to be made in the place referred to and in our later article (Ins. Ins. Mens., v, 38, 1917), by substituting for the name *boliviensis* that of *cruzii*. *Kerteszia*, therefore, is still unknown to us in nature; but it evidently cannot be used as a subgeneric name for the bromelicolus species, and for these a new term will be required. We suggest *Dendropædium*. This group is defined as having the thorax and abdomen hairy, without scales, the head with upright scales only. The thorax is elongated as in *Anopheles* proper and *Myzomyia*, from which it differs in having the hairs of the mesonotum not diffused over the surface, but gathered together in narrow depressed stripes, separated by broad straight bare spaces. The wing-scales are lanceolate as in *Anopheles*.

NOTES ON AMERICAN ANOPHELES

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

An attempt is here made to recognize the Anopheline genera proposed by Theobald in a subgeneric sense, using the scale characters to form groups within the genus. The latest works on the subject¹ have abandoned these groups, and, as Stanton remarks² "The natural affinities of species have been obscured by the division of the group into a multiplicity of genera." Still, I think this is in part due to the somewhat uncritical manner in which the scale-characters have been used. They are not of generic importance, clearly; but used as subgenera³ they may be an assistance in classification. As used in the following, it appears that allied species are grouped together, proper

¹ Edwards, Bull. Ent. Research, iii, 241, 1912; Stanton, Bull. Ent. Research, vi, 159, 1915; Christophers, Ind. Jour. Med. Research, iii, 454, 1916; Howard, Dyar & Knab, Mosq. N. & Cent. Am. & W. I., iv, 962, 1917.

² Stanton, Bull. Ent. Research, iv, 129, 1913.

³ Edwards at first (Bull. Ent. Research, ii, 141, 1911) used the names in the sense here proposed, but later abandoned the practice.

allowance being made for variation in the scale-characters. Used subgenerically, undue emphasis need not be laid upon them.

The subgenera occurring in America tabulate as follows:

Thorax and abdomen hairy, no scales.

Head with upright scales only.

Wing-scales lanceolate.

Thorax short, not over twice as long as wide,

Coelodiazesis Dyar & Knab

Thorax more elongate.

Hairs of mesonotum diffused.....*Anopheles* Meigen

Hairs in lines between broad bare spaces,

Dendropaedium Dyar & Knab

Wing-scales in part large and inflated,

Cyclolepteron Theobald

Head with flat scales in the median area.....*Stethomyia* Theobald

Thorax hairy or with a few scales on the margin; abdomen with scales.

Abdomen hairy dorsally with lateral scale-tufts,

Arribalzagia Theobald

Abdomen with large irregular black scales; no tufts,

Kertessia Theobald

Thorax with distinct narrow curved scales.

Abdomen hairy, or with scales only on the anal segment.

Antennæ hairy*Myzorhynchella* Theobald

Antennæ with scales at the whorls.....*Chagasia* Cruz

Abdomen hairy, the last three segments scaled; no tufts,

Manguinhosia Cruz

Abdomen scaled in part or throughout and with lateral tufts,

Cellia Theobald

Genus ANOPHELES Meigen

Subgenus COELODIAZESIS Dyar & Knab

Coelodiazesis Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 177, 1906.

Cyclophorus Eysell, Arch. Schiffs-u. Trop.-Hyg., xvi, 421, 1912.

Anopheles (Coelodiazesis) barberi Coquillett.

Anopheles barberi Coquillett, Can. Ent., xxxv, 310, 1903.

Eastern United States, the larvæ in tree-holes.

Subgenus ANOPHELES Meigen

Anopheles Meigen, Syst. Besch. bek. eur. zweifl. Ins., i, 10, 1818.

TABLE OF SPECIES

Tarsi wholly dark colored.

Hind tibiæ broadly white at apex.....*eiseni* Coquillett

Hind tibiæ without white apical ring.

Wings with a white spot at outer third of costa.

Palpi marked with white; third vein extensively white in the middle.....*pseudopunctipennis* Theobald

Palpi wholly black; third vein wholly black scaled,
punctipennis Say

Wings without such spot on the costa.

Wings with patches of yellowish scales; sixth vein with three black spots.....*crucians* Wiedemann

Wings without patches of pale scales.

Wing at apex with a coppery spot on fringe,
occidentalis Dyar & Knab

Wing-fringe uniformly dark throughout.

Body not wholly blackish; hairs of mesonotum yellow or white.

Palpi of the female blackish scaled throughout; wing scales forming spots at the bases of the fork-cells,

quadrимaculatus Say

Palpi of the female with dull silvery white rings at bases of joints; scales of wings mesially not distinctly massed at bases of fork-cells.....*walkeri* Theobald

Body blackish throughout; hairs of mesonotum dark brown.....*atropos* Dyar & Knab

Tarsi speckled with white.

Hind tarsi with the last two joints largely black,
vestitipennis Dyar & Knab

Hind tarsi with the last two joints wholly white,
annulipalpis Lynch Arribálzaga

Anopheles (Anopheles) eiseni Coquillett.

Anopheles eiseni Coquillett, Journ. N. Y. Ent. Soc., x, 192, 1902.

Myzomyia tibiamaculata Neiva, Brazil-Medico, xx, 288, 1906.

Tropical America, the larvæ in tree-holes and pools in rocks.

Anopheles (Anopheles) pseudopunctipennis Theobald.

Anopheles pseudopunctipennis Theobald, Mon. Culic., ii, 305, 1901.

Anopheles franciscanus McCracken, Ent. News, xv, 12, 1904.

Anopheles peruvianus Tamayo, Mem. de la Municipalidad de Lima, 1906, xxxv, 1907.

Proterorhynchus argentinus Brèthes, Bol. Inst. Ent. y Pat. Veg., i, 15, 1912.

Anopheles tucumans Lahille, An. Mus. Nac. Buen. Aires, xxiii, 253, 1912.

Tropical America and the adjacent warmer temperate regions, the larvæ in permanent ground pools.

Anopheles (Anopheles) punctipennis Say.

Culex punctipennis Say, Journ. Acad. Nat. Sci. Phil., iii, 9, 1823.

Culex hyemalis Fitch, Amer. Jn. Agr. & Sci., v, 281, 1847.

Anopheles perplexens Ludlow, Can. Ent., xxxix, 267, 1907.

Southern Canada, United States to central Mexico, the larvæ in ground pools, both permanent and temporary.

Anopheles (Anopheles) crucians Wiedemann.

Anopheles crucians Wiedemann, Ausser. zweifl. Ins., i, 12, 1828.

Southeastern United States and Greater Antilles, the larvæ in ground pools, especially near the coast.

Anopheles (Anopheles) quadrimaculatus Say.

Anopheles quadrimaculatus Say, Keating's Narr. Exp. Peter's Riv., ii, 356, 1824.

Anopheles guttulatus Harris, Hitch. Rept. Geol. Zool. Mass., 595, 1835.

Anopheles annulimanns van der Wulp, Tids. voor Ent., x, 129, 1867.

North America, east of the Rocky Mountains, the larvæ in permanent swamps, especially connected with rivers. The name *quadrimaculatus* apparently should be applied to the next species, but I have ignored that in order to avoid confusion that would result from the change.

Anopheles (Anopheles) occidentalis Dyar & Knab.

Anopheles occidentalis Dyar & Knab, Proc. Biol. Soc. Wash., xix, 159, 1906.

North America west of the Rocky Mountains and eastward through Canada to Maine, the larvæ in ground pools of permanent character.

Anopheles (Anopheles) atropos Dyar & Knab.

Anopheles atropos Dyar & Knab, Proc. Biol. Soc. Wash., xix, 160, 1906.

Florida Keys and Gulf Coast, the larva unknown.

Anopheles (Anopheles) walkeri Theobald.

Anopheles walkeri Theobald, Mon. Culic., i, 299, 1901.

Eastern North America, the larvæ in fluctuating swamps along rivers, filled by flood-water.

Anopheles (Anopheles) vestitipennis Dyar & Knab.

Anopheles vestitipennis Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Mexico, Central America and Greater Antilles, the larva unknown.

Anopheles (Anopheles) annulipalpis Lynch Arribálzaga.

Anopheles annulipalpis Arribálzaga, Nat. Arg., i, 149, 1878.

Anopheles annulipes Theobald (not Walker), Mon. Culic., v, 84, 1910.

Argentina, the larva unknown.

Subgenus **DENDROPAEDIUM** Dyar & Knab

Dendropaedium Dyar & Knab, Ins. Ins. Mens., vi, 141, 1918.

TABLE OF SPECIES

Wing with four white spots involving costa and first vein.

Third vein broadly white in the middle.

Hind tarsi with the last four joints black, apically ringed with white, the fifth wholly black.....*bellator* Dyar & Knab

Hind tarsi with these joints white with black rings at their bases*cruzii* Dyar & Knab

Third vein black, a minute white spot at base,

hylephilus Dyar & Knab

Wing with only the outer two spots involving the costa,

neivai Howard, Dyar & Knab

Anopheles (Dendropaedium) bellator Dyar & Knab.

Anopheles bellator Dyar & Knab, Proc. Biol. Soc. Wash., xix, 160, 1906.

Island of Trinidad, the larvæ in Bromeliaceæ.

Anopheles (Dendropaedium) cruzii Dyar & Knab.*Anopheles lutzii* Theobald (not Cruz), Mon. Culic., i, 177, 1901.*Anopheles cruzii* Dyar & Knab, Proc. U. S. N. M., xxxv, 53, 1908.

Brazil, the larvæ in Bromeliaceæ.

Anopheles (Dendropaedium) hylephilus Dyar & Knab.*Anopheles hylephilus* Dyar & Knab, Ins. Ins. Mens., v, 38, 1917.

Venezuela, Ecuador and Panama, the larva unknown.

Anopheles (Dendropaedium) neivai Howard, Dyar & Knab.*Anopheles neivai* Howard, Dyar & Knab, Mosq. N. & Cent. Am. & W. I., iv, 986, 1917.

Panama and southern Mexico, the larvæ in Bromeliaceæ.

Subgenus CYCLOLEPPTERON Theobald

Cyclopeppterion Theobald, Mon. Culic., i, 205, 1901.**Anopheles (Cyclopeppterion) grabhamii** Theobald.*Anopheles grabhamii* Theobald, Mon. Culic., i, 205, 1901.

Greater Antilles, the larvæ in ground pools.

Subgenus STETHOMYIA Theobald

Stethomyia Theobald, Journ. Trop. Med., v, 181, 1902.**Anopheles (Stethomyia) nimba** Theobald.*Stethomyia nimba* Theobald, Mon. Culic., iii, 62, 1903.

British Guiana and Brazil, the larva unknown.

Subgenus ARRIBALZAGIA Theobald

Arribalsagia Theobald, Mon. Culic., iii, 81, 1903.

TABLE OF SPECIES

Wing-scales considerably inflated, black ones on the base of the fourth vein being noticeable.

Third vein spotted; fourth and fifth hind tarsals white at base and tip *intermedium* Chagas

Third vein with a black spot at base, the rest mixed; fourth hind tarsal with a white middle band beside the white apices, the fifth commonly all white.

White on hind tarsi less extensive, appearing black with white rings; fifth joint sometimes with a small black band,

punctimacula Dyar & Knab

White on hind tarsi extensive, appearing white with black dots *mediopunctatus* Theobald

Wing-scales narrower, broadly elliptical to lanceolate.

Third vein mixed; fourth tarsal with white tip, the fifth all black,

maculipes Theobald

Third vein spotted; fourth and fifth tarsi white at base and tip.

Tarsi white at base and tip only.

Third vein white-scaled, a black spot at base and before tip; tip white..... *pseudomaculipes* Chagas

Third vein with five white spots, or four when the middle one is absent, the tip black,

apicimacula Dyar & Knab

Fourth hind tarsal with a middle white ring beside the tips,

fifth all white..... *strigimacula* Dyar & Knab

Anopheles (Arribalzagia) intermedium Chagas.

Cyclopeppterion intermedium Chagas, in Peryassú, Os Culic. do Brazil, 85, 1908.

Brazil, the larva unknown.

Anopheles (Arribalzagia) punctimacula Dyar & Knab.

Anopheles punctimacula Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Anopheles malefactor Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 198, 1907.

Panama, the larvæ in ground pools. In the monograph, Mr. Knab, at the last moment, placed *punctimacula* with *apicimacula* on his own responsibility. I agree with him in the reduction by one of the number of species, but I think that the single type of *punctimacula* is clearly a *malefactor* and not an *apicimacula*.

Anopheles (Arribalzagia) mediopunctatus Theobald.

Cyclopeppterion mediopunctatus Theobald, Mon. Culic., iii, 83, 1903.

Trinidad and Brazil, the larvæ unknown.

Anopheles (Arribalzagia) maculipes Theobald.

Arribalzagia maculipes Theobald, Mon. Culic., iii, 81, 1903.

Brazil, the larvæ in ground pools. The specimen from Trinidad recorded in the Monograph (page 992, Chaquanas, Trinidad, March, 1914, I. F. Lasalle) is not *maculipes*, but the variety of *apicimacula* without the central black spot on the third vein of the wing.

Anopheles (Arribalzagia) pseudomaculipes Chagas.

Arribalzagia pseudomaculipes Chagas, in Peryassú, Os Culic. do Brazil, 108, 1908.

Brazil, the larva unknown.

Anopheles (Arribalzagia) apicimacula Dyar & Knab.

Anopheles apicimacula Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Mexico, Central America and Trinidad, presumably also the northern coast of South America, the larvæ in pools in stream-beds.

Anopheles (Arribalzagia) strigimacula Dyar & Knab.

Anopheles strigimacula Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Tropical Mexico, the larvæ in pools in stream-beds.

Subgenus KERTESZIA Theobald

Kertessia Theobald, Ann. Nat. Mus. Hung., iii, 66, 1905.

Anopheles (Kerteszia) boliviensis Theobald.

Kertessia boliviensis Theobald, Ann. Nat. Mus. Hung., iii, 66, 1905.

Bolivia, the larvæ unknown. The identification of this species with *A. (Dendropacodium) cruzii* D. & K. made by Mr. Knab has been corrected on a previous page.

Subgenus MYZORHYNCHELLA Theobald

Myzorhynchella Theobald, Mon. Culic., iv, 78, 1907.

TABLE OF SPECIES (FROM PERYASSU)

1. Extremidade do pé (= os 4 ultimos articulos tarsaes) posterior completamente branca. Mesonoto unicolor, com 3 estrias escuras; azas com as costas distinctamente manchadas de amarello. Abdomen piloso, excepto o segmento genital que possui escamas,

lutzii Cruz

2. Idem, mas com as manchas da costa brancas e escamas brancas no segmento genital. Espécie menor que a *lutzii*.....*parva* Chagas
3. Idem, mas junto ás extremidades basaes dos 2os e 3os articulos posteriores ha um anel preto.....*nigritarsis* Chagas
5. Pernas posteriores com as extremidades apical da tibia e basal do metatarso brancas em grande extensão.....*gilesi* Neiva

Anopheles (Myzorhynchella) lutzii Cruz.

Anopheles lutzii Cruz, Brazil-Medico, xv, 423, 1901.

Myzorhynchella nigra Theobald, Mon. Culic., v, 78, 1907.

Brazil, the larvæ unknown. The species is not before me.

Anopheles (Myzorhynchella) parva Chagas.

Myzorhynchella parva Chagas, Nov. Esp. de Cul. Braz., 4, 1907.

Brazil, the larva unknown.

Anopheles (Myzorhynchella) nigritarsis Chagas.

Myzorhynchella nigritarsis Chagas, in Peryassú, Os Culic. do Brazil, 97, 1908.

Brazil, the larvæ unknown. The species is not before me.

Anopheles (Myzorhynchella) gilesi Neiva.

Myzorhynchella gilesi Neiva, in Peryassú, Os Culic. do Brazil, 103, 1908.

Brazil, the larvæ unknown. The species is not before me.

Subgenus CHAGASIA Cruz

Chagasia Cruz, Brazil-Medico, xx, 199, 1906.

Anopheles (Chagasia) farjardi Lutz.

Pyretophorus farjardi Lutz, in Bourroul, Mosq. do Brasil, 16, 1904.

Chagasia nivae Cruz, Brazil-Medico, xx, 199, 1906.

Brazil, the larvæ unknown.

Subgenus MANGUINHOSIA Cruz

Manguinhosia Cruz, Um Nov. Gen. Braz. da s.-f. "Anophelinæ," 1907.

Anopheles (Manguinhosia) peryassui Dyar & Knab.

Manguinhosia lutzii Cruz (not *Anopheles lutzii* Cruz), Um Nov. Gen. Braz. da s.-f. "Anophelinae," 1907.

Anopheles peryassui Dyar & Knab, Proc. U. S. N. M., xxxv, 53, note, 1908.

Brazil, the larvæ unknown.

Subgenus *CELLIA* Theobald

Cellia Theobald, Journ. Trop. Med., v, 183, 1902.

TABLE OF SPECIES

Hind tarsi all white beyond the second joint.

Scales on the dorsum of all the abdominal segments.

Lower fork of the second vein with a white patch at the tip,
argyritarsis Robineau-Desvoidy

Lower fork of second vein with a black patch at the tip,
pictipennis Philippi

Scales on the last two abdominal segments only,
braziliensis Chagas

Hind tarsi similar but with a black spot on the last joint.

Palpi with the last two joints white except narrowly at bases,
tarsimaculata Goeldi

Palpi with the last joint only white.....*albimanus* Wiedemann

Anopheles (Cellia) argyritarsis Robineau-Desvoidy.

Anopheles argyritarsis Robineau-Desvoidy, Mém. Soc. d'Hist. Nat., iii, 411, 1827.

Tropical American mainland, Lesser Antilles, the larvæ in ground pools and artificial receptacles. The abdominal scale-tufts, which condition the subgeneric reference, are occasionally wanting in this species.

Anopheles (Cellia) pictipennis Philippi.

Culex pictipennis Philippi, Verh. z.-b. Ges. Wien, xv, 596, 1865.

Anopheles albitarsis Lynch Arribálzaga, El Nat. Arg., i, 151, 1878.

Anopheles bigotii Theobald, Mon. Culic., i, 135, 1901.

Chile and Argentina, the larva unknown. This is not before me.

Anopheles (Cellia) braziliensis Chagas.

Cellia braziliensis Chagas, Nov. Esp. de Cul. Braz., 18, 1907.

Brazil, the larvæ unknown.

Anopheles (Cellia) tarsimaculata Goeldi.¹

Anopheles tarsimaculata Goeldi, Os Mosq. no Pará, 133, 1905.

Anopheles gorgasi Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 198, 1907.

Tropical American mainland, Lesser Antilles, the larvæ in ground pools of any kind except artificial.

Anopheles (Cellia) albimanus Wiedemann.¹

Anopheles albimanus Wiedemann, Dipt. Exot., 10, 1821.

Anopheles cubensis Agramonte, El Progreso Medico, x, 460, 1900.

Anopheles argyrotarsis albipes Theobald, Mon. Culic., i, 125, 1901.

Anopheles dubius Blanchard, Les Moust., 205, 1905.

Tropical America, including the Greater Antilles and southern Florida, the larvæ in ground pools, often of brackish water.

NEW MUSCOID GENERA, SPECIES AND SYNONYMY

(Diptera)

By CHARLES H. T. TOWNSEND

In the revision of muscoid groups and genera, based mostly on material in the National Museum collection, it becomes necessary to characterize the following new genera and species:

Pseudogymnosoma, new genus.

Genotype, *Pseudogymnosoma inflatum*, new species.

No hypopleurals. Abdomen inflated and globose, like *Rhodogyne*, nearly bare. Head much like *Stomorhina*, but epistoma short and not widened nor sprung convexly, the face being dished. No facial carina. Arista plumose. Palpi widened and flattened. Upper facets of male eyes greatly enlarged. Male hypopygium small.

¹ Compare an article by James Zetek on the relationship of these two forms (Ann. Ent. Soc. Am., viii, 221-271, 1915). The same intergradation in palpal coloration has recently been observed in specimens from Guayaquil, Ecuador (F. Campos R.).

Pseudogymnosoma inflatum, new species.

Length, 5.5 to 7 mm. Four males and one female, Benguella, Angola, Africa (F. C. Wellman).

Head black, with silvery maculations or areas. Thorax and scutellum metallic violet. Abdomen yellowish to fulvous. Legs and palpi blackish. Antennæ blackish, the second joint more or less tinged with rufous. Tegulæ whitish, with smoky tinge. Wings clear, with more or less distinct blackish along costa in male.

Graphomuscina, new genus.

Genotype, *Graphomuscina africana*, new species.

Venation of *Muscina*, but head in general and thoracic vittæ of *Graphomya*. Frontalia not separated by ocellar triangle. Epistoma not so elongate as in *Graphomya*, and not so wide nor sprung. Tegulæ large. Only hypopleural hairs present.

Graphomuscina africana, new species.

Length, 7 mm. One female, Benguella, Angola, Africa (F. C. Wellman).

Head grayish, antennæ and frontalia brown, palpi fulvous. Thorax brownish, rufous on sides, with three heavy black vittæ. Scutellum, abdomen and legs brownish-rufous, the tarsi brownish. Tegulæ whitish. Wings clear.

Rhinogastrophilus, new genus.

Genotype, *Oestrus nasalis* Linne.

Differs from *Gasterophilus* in entirely lacking the rudimentary button-like palpi, as well as the proboscis tubercle. The female has a sharp chitinous ovipositor, functionally distinct from that of *Gasterophilus*. See Can. Ent., L, 246-248 (July, 1918).

Loewioestrus, new genus.

Genotype, *Cephalomyia variolosa* H. Loew, 1863, Wien. Ent. Monatschr., VII, 15.

Differs from *Oestrus* by posterior crossvein being removed almost its length from cubitus, the apical cell much more

elongate, and small crossvein inside middle of discal cell. *Ocstrus* has the posterior crossvein almost at the cubitus, apical cell short, and small crossvein outside middle of discal cell.

Neokirkia, new genus.

Genotype, *Kirkia minuta* Rodhain & Bequaert, 1915, Bull. Soc. Path. Exot., VIII, 456.

Differs from *Kirkioestrus* by auxiliary vein ending opposite small crossvein, and petiole of apical cell in line with third vein. *Kirkioestrus* has small crossvein half way between ends of auxiliary and first veins, while petiole of apical cell is bent up at right angle to third vein.

Microcephalopsis, new genus.

Genotype, *Microcephalus neugebaueri* Portchinski, 1881, Horae Soc. Ent. Ross., XVI, 137; XXI, pl. 1, ff. 8, 8a.

Differs from *Portchinskia* by small crossvein not being dilated in middle, posterior crossvein well removed from cubitus, and front of male very narrow, the eyes being greatly approximated.

The holotype was taken on Mount Brione in the Italian Tyrol, in September (Schnabl, Deutsch. Ent. Zeitschr., XXVI, 14).

Compsomyiops, new genus.

Genotype, *Calliphora fulvipes* Macq., 1843, Dipt. Exot., II, 3, 132, pl. 16, f. 3.

Differs from *Cochliomyia* by the palpi being long and widened apically; frontalia of female greatly widened posteriorly, densely hairy on posterior half; parafrontalia of female very thickly set with pilelike hair; parafacialia bare on lower part, which is narrowed to a mere strip by the cheek grooves; tegulae hairy on front half; no proclinate fronto-orbitals in either sex.

Numerous specimens from the high Andes of Peru and Ecuador, collected by the Yale Peruvian Expedition, F. Campos, and myself; and from Chile, collected by F. C. Reed.

Chrysomya whceleri Hough also belongs here. The genus is characteristic of mountain regions of western America, especially the high Andes and the Mexican Sierra Madre, as well as temperate South America.

Hemipyrellia, new genus.

Genotype, *Hemipyrellia curriei*, new species.

Hypopleurals present. Front and face like *Pyrellia*. Fourth vein bent suddenly at cubitus at a little more than a right angle. Clypeus only a little longer than broad. Epistoma not narrowed by vibrissal angles, vibrissæ on oral margin. Female parafrontalia wide, the orbitals not crowded into frontals. Two proclinate orbitals in female. Tegulæ bare.

Hemipyrellia curriei, new species.

Length, 6 mm. One female, Mount Coffee, Liberia (R. P. Currie).

Head grayish; vertex metallic blackish, frontalia brown, palpi rufous, antennæ more or less rufous. Thorax, scutellum and abdomen metallic green with bluish reflections; hind edge of segments narrowly black. Legs blackish. Tegulæ white. Wings clear.

Auchmeromyiella, new genus.

Genotype, *Auchmeromyiella angola*, new species.

Differs from *Zonochroa* by the labella being well developed, parafacialia with fine row of microscopic microchætæ above, female with one proclinate and one reclinate orbital, and abdomen not widened but conspicuously pointed behind.

Auchmeromyiella angola, new species.

Length, 5 to 6 mm. Seven females and two males, Benguella, Angola, Africa (F. C. Wellman).

Pale tawny fulvous, hind margins of abdominal segments more or less distinctly brown. Palpi and antennæ deeper fulvous. Frontalia and mesoscutum subrufous tinged, latter at times showing two faint broad darker vittæ. Tegulæ glassy. Wings clear.

Huascaromusca, new genus.

Genotype, *Huascaromusca cruciata*, new species.

Strong hypopleural bristles. Head small. Clypeus elongate and narrowed. Frontals strong. Female with a cruciate pair of macrochætæ on median line of frontalia just in front of ocellar triangle. A strong proclinate pair of ocellars. Female with two strong erect proclinate orbitals, and one strong reclinate. Mesoscutal macrochætæ long, erect, curved posteriorly. Wings very long and broad. Abdomen short and wide, subrounded behind in female. Otherwise as in *Mesembrinella*.

Huascaromusca cruciata, new species.

Length, 9 mm. One female, Huascaray Ridge, Jaen Province, Peru, about 7,000 feet, September 22, 1911 (C. H. T. Townsend).

Brownish-black. Frontalia, antennæ and palpi deep rufous. Face and cheeks rufous, with thin silvery coating. Thorax, scutellum and abdomen submetallic violet. Legs blackish. Tegulæ smoky. Wings faintly tinged with smoky on base and costa.

Chlorobrachycoma, new genus.

Genotype, *Chlorobrachycoma splendida*, new species.

Clypeus shallow, rather wide, dished. Epistoma slightly narrowed, long, warped forward well below vibrissæ. Palpi long, widened apically. Arista long, short-plumose less than half way. Eyes bare. Frontals stopping even with base of antennæ. Frontalia wide and short. Female with one proclinate orbital, the anterior one, while in place of posterior one is a bunch of bristles and hairs; also one reclinate orbital. Ocellars present. Parafacialia hairy above and with row of microchætæ near orbit below. Tegulæ small, bare. No median marginals on first two segments, sparse marginal row on third, marginals and discals on anal segment. Apical cell open before tip. Has sarcophagid habitus, but belongs in the Muscini.

Chlorobrachycoma splendida, new species.

Length, 8.5 mm. One female, Oroya, Peru, May 8, 1914 (C. H. T. Townsend).

Bright green. Cheeks, parafacialia and parafrontalia silvery, mottled with blackish-green reflections. Antennæ, clypeus and palpi deep black. Thorax, scutellum and abdomen bright green with some violet reflections, and with more or less silvery pollen showing in some lights. Legs blackish. Tegulæ whitish. Wings nearly clear, only faintly smoky.

Sarconesiopsis, new genus.

Genotype, *Sarconesiopsis caerulea*, new species.

Clypeus shallow, not narrowed above, about twice as long as wide. Epistoma elongate, full width of clypeus. Facialia short-ciliate over half way above vibrissæ. Eyes bare. Arista plumose a little over half way. Parafacialia hairy except on lower fourth. Mesoscutum conspicuously trivittate. Apical cell open before tip. Wrinkle at cubitus. Squamæ bare. No median marginals on first two abdominal segments, marginal row on third, marginal and discal bristles on anal segment. Three postsuturals and two sternopleurals. Belongs in the Muscini.

Sarconesiopsis caerulea, new species.

Length, 8.5 to 9.5 mm. Two females, Oroya, Peru, May 7, 1914 (C. H. T. Townsend); five females and one male, Quito, Ecuador (F. Campos).

Head blackish, pale golden pollinose with blackish reflections. Palpi rufous, tinged with brown. Frontalia brown. Mesoscutum blackish, thinly silvery, with three heavy black vittæ. Scutellum metallic green. Abdomen metallic green, with bluish reflections. Legs blackish. Tegulæ fuscous. Wings faintly smoky.

(To be continued.)

Date of publication, October 30, 1918.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar

Subscriptions and matter for publication should be addressed to Harrison G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the manuscript.

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INSECUTOR INSCITIZÆ MENSTRUUS

A MONTHLY JOURNAL OF ENTOMOLOGY

CONDUCTED BY HARRISON G. DYAR, WASHINGTON, D. C.

Vol. VI

OCTOBER-DECEMBER, 1918

Nos. 10-12



Insecutor Inscitiae Menstruus

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NEW MUSCOID GENERA, SPECIES AND SYNONYMY

(*Diptera*)

By CHARLES H. T. TOWNSEND

(Continued from page 156)

Bombobrachycoma, new genus.

Genotype. *Brachycoma davidsoni* Coquillett, 1894, Ent. News, V, 172. Reared by Davidson from *Bombus* larvæ in California.

Differs from *Brachycoma* by having preacrostichals developed, clypeus short and extra-deeply sunken, third antennal joint short; epistoma heavily warped forward and produced, almost in horizontal plane, nearly as long as clypeus; female palpi much swollen apically.

Euparaphyto auromaculata, new species.

Length, 9 to 10 mm. One male and one female, Oroya, Peru, March 7, 1913; and one female, same locality, May 7, 1914 (C. H. T. Townsend).

Close to the species described in the male by Josef Bischof as *Microcerella rufomaculata* (Z. B. Gesellsch., LIV, 97-101). Differs from Bischof's description as follows: Sternopleurals 1.1.1; notopleurals 1.1.1.1; three supraalars; a discal pair of scutellars. Cheeks with a large deep golden spot. Outer edge of scutellum light golden, the apex faintly silvery. A small golden spot below humeri on propleura. Venter with corresponding deep golden spots on sides of first three segments, the anal segment with a silvery spot instead; ventral plates two to four largely golden; a small light golden spot on side of first

segment above; a small subevanescent gold spot on metapleura, but outside of this and the propleural spot the smallest (of the four remaining spots) is on the pteropleura. Thus in all there are six pleural gold spots. Tegulæ light golden, hind scale whitish posteriorly. The female has the lateral ventral spot of anal segment golden, the sides of first hypopygial segment golden, and also differs from the male in having two postalar bristles and no postsuturals, one proclinate orbital and two divaricate reclinate orbitals, and the outer vertical approaching the inner in strength. Male claws strongly elongated. All tarsal joints strongly double-spined apically in both sexes. Fourth ventral plate of male conspicuously rounded off on hind corners and bearing a single median process before posterior margin in the form of a pointed hump which appears due to pressure of base of fifth ventral plate below it. Fifth ventral plate deeply slit posteriorly, the edges of slit oblique but even. Ventral plates of female all exposed, two to four overlapping the lateral ends of the tergites, five and six overlapped by the lateral ends of fifth or anal tergite.

Aulacophyto, new genus.

Genotype, *Aulacophyto auromaculata*, new species.

Allied to *Euparaphyto* and *Microcerella*. Head higher than long. Antennæ reaching well beyond middle of face, second joint elongate, third joint one and a half times to twice the length of second. Male front much narrowed. Female parafrontalia conspicuously longitudinally corrugated or furrowed on posterior half. No proclinate or reclinate fronto-orbitals in either sex. Parafacialia with row of very fine weak hairs. Arista thickened about or nearly half way. No discals on scutellum. Acrostichals entirely absent, only one postsutural in female but three in male, two sternopleurals. Costal spine vestigial. Third vein bristled only at base.

Aulacophyto auromaculata, new species.

Length, 7 to 9 mm. Numerous males and females, Oroya, Peru, March 7, 1913, and May 7, 1914 (C. H. T. Townsend).

Differs in coloration from *Euparaphyto auromaculata* as

follows: Parafacialia in middle and parafrontalia before middle light to deep golden, the space between soft to subshining black. Prohumeral spot silvery, mesopleural golden spot very large and longitudinally elongate; upper sternopleural spot very small, almost obliterated; lower sternopleural spot small, no trace of spot on metapleura; thus only four pleural gold spots. Scutellum silvery on sides, more or less deeply golden on apex. The two wide median pollinose vittæ of mesoscutum are deep golden on posterior half of postscutum. The pollen of venter is often silvery in male instead of golden; but normally it is light to deep golden in male, and always deep golden in greater part in female. Tegulæ more whitish in some males.

Afrowohlfahrtia, new genus.

Genotype, *Afrowohlfahrtia pachytyli*, new species.

Clypeus much dished; epistoma narrow, short, strongly warped: arista very short-pubescent. Front wide in both sexes. Parafacialia sparsely but quite evenly bristled, as much below as above, at times less in middle. Two sternopleurals and two postsuturals; no preacrostichals, one postacrostichal. Costal spine absent, third vein bristled half way to small cross-vein. Male without either proclinate or reclinate orbitals, female with two very short proclinales.

Afrowohlfahrtia pachytyli, new species.

Length, 11 to 13 mm. Three males and three females, reared by C. W. Howard, in Transvaal, South Africa, from *Pachytylus sulcicollis* and determined by Coquillett as *Agria brunnipalpis* Mcq.

Differs from Macquart's description of *brunnipalpis* as follows: Palpi fulvous, blackish apically. Frontalia quite distinct. Third antennal joint without white at base. Thoracic vittæ very conspicuous. First abdominal segment with three heavy irregular confluent black markings which leave more or less of gray on hind margin and sides; second segment with median heavy black spot dilated on front margin, smaller spot each side on hind margin; third and anal segments with three spots along hind margin; and an additional small spot on each side

of each segment at insertion of lateral marginal macrochæta. Venter quite entirely brown to blackish, only showing the tergal gray narrowly on lateral edges. Hind tibiæ not villous. Tegulæ pure white. Wings clear at base, as elsewhere.

Hystriocnema, new genus.

Genotype, *Sarcophaga robusta* Aldrich, 1916, Sarc. & Allies, 268.

Flexor surface of male hind femora well set with short sharp spines, being a specialization in direction of *Thclylepticocnema*, the hind tibiæ being at the same time shortened. The tibiæ are only short-hairy, not long-villous in male. The female runs to *Orysarcoderia* in table of Sarcophagini (Proc. Biol. Soc. Wash., XXX, 192-195), and differs from *Paraphrissopoda* in the entire first hypopygial segment.

Mantidophaga, new genus.

Genotype, *Mantidophaga stagmomantidis*, new species.

Allied to *Blaesoriphotheca*. Clypeus rather narrow, narrowing below. Epistoma narrow, cut off close below vibrissæ. Female palpi well swollen at tip. Arista long, thinly plumose scarcely half way. Lowest four to six of facio-orbital row bristly. Preacrostichals developed. First vein bristled on middle, third vein bristled to small crossvein. Weak median marginal pair of macrochætæ on second abdominal segment, strong erect marginal row on third and anal segments.

Mantidophaga stagmomantidis, new species.

Length, 6.5 to 7 mm. Three females reared by Mr. A. B. Gahan, Washington, D. C., from *Stagmomantis carolina* (See Proc. Ent. Soc. Wash., XVII, 24, recorded as *Helicobia helcis*).

Blackish, gray-cinereous pollinose. Antennæ, palpi and legs blackish. Frontalia and cheek-grooves brownish-rufous. Thorax with three black vittæ. Abdomen tessellate with yellowish-silvery pollen. Tegulæ watery-white. Wings clear.

Gymnopsoa, new genus.

Genotype, *Gymnopsoa texana*, new species.

Belongs in Sarcophagini. Clypeus shallow, rather broad and short. Epistoma wide, well warped. Arista pubescent. Two proclinate and two reclinate orbitals in female. Parafacialia with several bristles below. Sides of mesoscutum broadly bare of microchaetæ both before and behind suture in two conspicuous longitudinal stripes. Costal spine very strong. Third vein strongly bristled to small crossvein. First hypopygial tergite of female not excised.

Gymnopsoa texana, new species.

Length, 9 mm. One female, Texas (collection C. V. Riley).

Light cinereous. Antennæ, palpi and legs blackish, third antennal joint tinged with rufous. Frontalia brown. Two broad thoracic vittæ, with a narrow one between them. Bases of last three abdominal segments with four yellowish-silvery pollinose spots and two fuscous spots. Tegulæ white. Wings nearly clear.

Santschia, new genus.

Genotype, *Santschia algeriensis*, new species.

Belongs in Tephromyini. Epistoma narrow, short, cut off close below vibrissæ. Arista pubescent on basal half. Frontals extremely shortened, erect, stubby, sharp. Female with two short verticals, two very short stubby proclinate and one reclinate orbitals. Ocellars present. Parafacialia narrow, with double row of fine short stubby microchaetæ. Preacrostichals present but very short. Third vein bristled far beyond small crossvein, about two-thirds to three-fourths way to tip. Abdominal macrochaetæ atrophied, practically absent, only some short vestigial ones on sides of first segment and some extremely short vestigial marginals on last two segments; rest of abdomen wholly and evenly set with short microchaetæ. Apical cell short-petiolate. Female hypopygium telescopic.

Santschia algeriensis, new species.

Length, 4.5 mm. One female, Kairouan, Algeria, August,

1907, collected by Dr. F. Santschi, in whose honor the genus is named.

Brownish-rufous, with gray pollen. Antennæ, palpi and legs fulvous; tarsi brown. Three narrow blackish thoracic vittæ. Abdomen faintly showing three brown vittæ over first three segments. Tegulæ white. Wings clear.

Stenaulacotheca, new genus.

Genotype, *Sarcophaga spatulata* Aldrich, 1916, Sarc. & Allies, 105.

Epistoma narrow, extended well below vibrissæ. Arista thinly plumose half way. Parafacialia narrow, with only faint indication of two to four bristlets below near orbit. Weak marginal row of bristles on second segment, strong marginal row on third and anal segments. Theca of female very narrow, elongate, curved upward at tip, with dorsal groove. Allied to *Protodexia*, from which it is easily distinguished by the above characters.

Eubrachymera, new genus.

Genotype, *Eubrachymera debilis*, new species.

Differs from *Brachymera* in arista thickened only half way, apical cell ending but little before wing tip, macrochætæ all much weaker, and third vein bristled only at base.

Eubrachymera debilis, new species.

Length, ♂ to 8.5 mm. Two females, Brookings, South Dakota, reared June 14, 1918, by H. C. Severin from *Neurotoma inconspicua* Norton, a web-making sawfly on plum; transmitted by J. M. Aldrich.

Brown, cinereous pollinose. Antennæ and palpi blackish. Two narrow inner and two broader outer thoracic vittæ. Abdomen broadly silvery on bases of last three segments. Tegulæ white. Wings clear.

Oestrohilarella, new genus.

Genotype, *Hilarella aristalis* Coquillett, 1897, Rev. Tach., 129 (southern Illinois).

Front produced, face very receding. Frontal profile as long as facial; oral nearly two-thirds of facial and almost in perfect arcuate form from facial. Epistoma very narrow, not quite as long as wide, warped. Arista short, bare, thickened to a little short of tip. Parafacialia narrow, bare. Apical cell closed before tip of wing. Abdomen short-oval, arched; macrochaetae reduced to hairs or bristly hairs.

Neonyctia, new genus.

Genotype, *Neonyctia ciliata*, new species.

Belongs in *Melanophora* group. Eyes bare. Antennae inserted below eye middle. Arista long-pubescent or very short-plumose to tip. Frontals stopping at base of antennae. Ocellars present. Apical cell open just before tip. Third vein bristled only at base. Hind crossvein about in middle between small crossvein and cubitus. No median discals on intermediate abdominal segments.

Neonyctia ciliata, new species.

Length, 3.75 to 5 mm. Seven females, Lawrence, Kansas; one female, North Carolina. Determined by Coquillett as "*Chaetona ciliata* Wulp."

Brown, silvery pollinose. Antennae and frontalia rufous-brown. Palpi fulvous, smoky apically. Two narrow inner and two heavy outer thoracic vittae. Abdomen silvery on bases of last three segments. Tegulae white. Wings nearly clear.

Eophyto, new genus.

Genotype, *Eophyto ceylanica*, new species.

Belongs in *Melanophora* group. Vibrissae short, but decussate. Eyes bare. Arista hairlike, bare, thickened only at base. Frontals diverging one bristle below base of antennae. Parafacialia narrow. One proclinate and two reclinate orbitals in female. No ocellars. Female with only one vertical. Four or five facio-orbitals in row from frontals to vibrissal level. Two sternopleurals. Preacrostichals very short but longer than the microchaetae. Costal spine strong. Apical cell long-petiolate, the petiole longer than hind crossvein; latter nearer to small

crossvein than to cubitus. A weak median marginal pair on first segment, stronger pair on second and third segments, marginal and discal rows on anal segment.

Eophyto ceylanica, new species.

Length, 4.5 mm. One female, Peradeniya, Ceylon, June 3, 1914 (A. Rutherford).

Brownish, thinly silvery pollinose. Antennæ blackish, articulation of last two joints rufous. Palpi fulvous. Frontalia velvet-brown. Two heavy and one narrow black thoracic vittæ. Bases of abdominal segments thinly silvery. Tegulæ watery. Wings with clouds on stigma, outer half of second vein, and apical and hind crossveins.

Panacemyia, new genus.

Genotype, *Panacemyia panamensis*, new species.

Has head characters of *Acemya*, but third antennal joint is not mucronate. Arista long-pubescent. Three sternopleurals, three postintraalars, three postsuturals, three preacrostichals, and three postacrostichals. A median marginal pair on first two segments, median discal pair on second and third segments, marginal row on third segment; marginal and discal rows on anal segment, the marginal weaker. Ovipositor like that of *Oestrogaster*, but projected straight down from end of anal segment.

Panacemyia panamensis, new species.

Length, 5.5 mm. One female, Taboga Island, Panama, February 26, 1912 (A. Busck).

Brownish, silvery pollinose with faint yellowish tinge. Antennæ and palpi fulvous. Frontalia velvety dark brown. Four strongly marked velvety dark brown thoracic vittæ, the outer pair a little wider than inner. First abdominal segment nearly all brown above, second brown on posterior half, third brown on posterior margin. Tegulæ whitish. Wings nearly clear.

Ormiophasisia, new genus.

Genotype, *Ormiophasisia busckii*, new species.

Allied to *Ormia*. Parafacialia bare, narrow. Facialia about

twice as wide as parafacialia, the vibrissal area well set with microchaetæ. Third antennal joint twice as long as second. Arista pubescent half way. Female vertex little more than half of one eye, front widening very slightly therefrom. Ocelli well developed, ocellar bristles absent. Prosternal membrane well inflated. Preacrostichals present. Strong stump at cubitus. Seventh tergite of female showing as a pair of heavy forceps with dense hair-brushes on inside edge.

Ormiophasia busckii, new species.

Length, 8 mm.; width of abdomen, nearly 4 mm. One female, Cabima, Panama, May 24, 1911, collected by Mr. August Busck, in whose honor the species is named.

Fulvous, with thin coating of tawny pollen on head and silvery on mesoscutum, leaving on latter five fulvous vittæ. Abdomen rather deeply brownish dorsally. Tibiæ and tarsi tinged with brown. Tegulæ smoky-yellowish. Wings nearly clear. Epaulet concolorous with wing-base and pleura.

Therobia abdominalis Wiedemann.

Neither Wiedemann nor Brauer mention the enormously swollen prosternal membrane of female nor the entire lack of ocelli. Their specimen was a female.

Aulacocephalopsis, new genus.

Genotype, *Aulacephala badia* Gerstaecker, 1863, Verh. Z. B. Ges. Wien, XIII.

Belongs in the Ormiinae, and differs from *Aulacephala* as follows: Head not flattened, that of male subhemispherical, that of female with prominent front. Facial carina continued downward in a shallow furrow, which is the greatly narrowed and extended epistoma, lying between the greatly enlarged facialia. Antennal pit shallow. Third antennal joint reniform, but little longer than second. Arista very long, thin, bare, thickened only at base. Eyes of female proportionately short, those of male contiguous above and descending low. In the male the anterior ocellus is large, but the two posterior ocelli are small and pressed into the sides of

the ocellar tubercle. No buccal cavity, the vestiges of proboscis and palpi appearing as three subequal short stumps projecting from periphery of head in the oral region. Facets of upper-anterior area of eye enlarged in male. Prosternal membrane inflated bladderlike, more in female than in male, forming a bipartite buffer on which rests the lower occiput.

Therobiopsis, new genus.

Genotype, *Aulaccephala braueri* Kertész, 1899, 'Termes. Füzetek, XXII, 481-482.

Differs from *Aulaccephala* mainly in the apical cell being closed in margin a little before wing-tip. The third antennal joint is distinctly shorter than second. The female has two strong verticals on each side, two proclinate and one reclinate orbitals. Two sternopleurals, two postintraalars, three postsuturals, one preacrostichal, and one postacrostichal. The wings are without spots.

Eutrixopsis, new genus.

Genotype, *Eutrixopsis javana*, new species.

Facial carina low, flat, separating the antennæ. Epistoma narrow, wider than length of second antennal joint, receding and widening below to oral margin. Facialia wide and bare above, with closely set weak bristles below vibrissal angles. Proboscis short. Male eyes contiguous, facets of lower fourth distinctly smaller. Male lacking both verticals and orbitals; frontalia obscured by the parafrontalia meeting over them, showing only slightly next lunula and ocellar triangle. Two sternopleurals, one postintraalar, three postsuturals, no preacrostichals, one postacrostichal. Apical cell open in tip. No costal spine. Only weak marginal bristles on abdomen.

Eutrixopsis javana, new species.

Length, 5.5 mm. One male, Pelaboean, Ratoe, Java (Bryant & Palmer).

Wholly brownish-fulvous, including antennæ and palpi; tarsi darker, basal half or more of abdominal segments yellowish. Tegulæ tawny-whitish. Wings clear.

Argyrochaetona, new genus.

Genotype, *Argyrochaetona cubana*, new species.

Clypeus well depressed. Epistoma full width, cut off short. Palpi short, much broadened and flattened apically. Eyes bare, descending nearly to lower border of head. Male vertex less than half eye, parafrontalia meeting over frontalia in middle. Frontals descending one bristle below base of antennæ. Para-facialia very narrow, bare. Male with two very strong fronto-orbitals, the anterior one reclinate; and one or two weak reclinate ones behind. Ocellars very weak. Preacrostichals present. Apical cell open considerably before tip. First two abdominal segments with a median marginal pair, that of first weak; last two segments with marginal row.

Argyrochaetona cubana, new species.

Length, 6 mm. One male, Santiago de las Vegas, Cuba (P. Cardin).

Face and front silvery-white. Frontalia brown. Antennæ blackish, second joint and base of third pale rufous. Palpi fulvous. Mesoscutum, scutellum and abdomen pale golden pollinose over black, leaving four vittæ on first; all of first abdominal segment and broad hind borders of other segments black. Legs brown. Tegulæ watery-whitish. Wings clear.

Orthaporis, new genus.

Genotype, *Orthaporis similis*, new species.

Chaetotaxy and venation of *Paraporis*. Abdomen greatly elongated, much longer than wings; five segments visible from above in male, the first half as long as the second, the third and fourth equal in length and much longer than the second and fifth, the last scarcely caudate. Clypeus flush with face. Frontals stopping at base of antennæ.

Orthaporis similis, new species.

Length, 21 mm. One male, Rio Janeiro, Brazil, November (H. H. Smith).

Chestnut-brown, thinly silvery pollinose. Palpi and base of third antennal joint fulvous. Four thoracic vittæ, the inner

pair narrower. Last four abdominal segments with a large silvery spot on each side near base; a well-marked median abdominal vitta of brown. Tegulæ watery, faintly fuscous. Costa and wing veins well clouded.

Phyllolabella, new genus.

Genotype, *Phyllolabella robusta*, new species.

This is a *Paraporia* group form with the abdomen shortened and stout, the clypeus sunken, the facialia widened and ciliate. The labella are unusually large, even for this group, and leaf-like. Epistoma warped, full width, short. Eyes thickly pilose. Proboscis short. Palpi wide, sticklike, heavy, bare below and on outer basal half or more of upper side. Abdomen broadly oval in both sexes, subrounded anally.

Phyllolabella robusta, new species.

Length, 10.5 to 12 mm. One male and one female, Chapada, Brazil (H. H. Smith).

Brownish to chestnut, silvery pollinose, with faint golden tinge. Palpi fulvous. Third antennal joint largely rufous. Frontalia dark brown. The outer heavy and inner narrow dark brown or blackish thoracic vittæ of each side are closely approximated. First abdominal segment and a large irregular triangle on each side of second and third segments dark brown; irregular lateral vitta on anal segment shading from brown or light brown to rufous behind. Legs brown, tarsi a little darker. Tegulæ nearly white. Wings nearly clear, the veins faintly and narrowly smoky in male.

Pelecotheca, new genus.

Genotype, *Pelecotheca panamensis*, new species.

Differs from *Euthelaira* as follows: Eyes thinly hairy. Arista practically bare, only microscopically short-pubescent. Third antennal joint of female very slender. Anal segment with a marginal row of heavy erect macrochætæ and without discals. Female theca heavy, corneous, axlike in shape, its plane in the vertical.

***Pelecotheca panamensis*, new species.**

Length, 7 to 8 mm. Two females, Las Cascadas, Canal Zone, Panama (Dr. A. H. Jennings).

Dark brown or blackish, silvery-white pollinose. Antennæ largely fulvous. Palpi pale fulvous. Thoracic and scutellar pollen with a faint golden shade, that of abdomen less so. Four blackish thoracic vittæ, inner pair narrow, outer pair interrupted at suture. First abdominal segment and hind half of the other segments without pollen, blackish. Legs dark brown. Tegulæ nearly white. Wings nearly clear, veins and especially costa faintly clouded with fuscous.

***Eupelecotheca*, new genus.**

Genotype, *Eupelecotheca celer*, new species.

Has head of *Euthelaira* and axlike theca of *Pelecotheca*. Differs from both by having median discals on the intermediate abdominal segments. Arista bare, long and thin. Upper half of face about as wide as one eye. Eyes thickly pilose. Proboscis very short, the labella very large. Facialia ciliate. Two strong median marginal pairs on first segment; anal segment with marginal and discal rows. Apical cell widely open well before tip; apical crossvein elongate, parallel with hind margin and nearly parallel with hind crossvein, the latter approximated to cubitus. Third vein bristly only at base. Abdomen elongate-conical.

***Eupelecotheca celer*, new species.**

Length, 8 mm. One female, Rock Creek, District of Columbia, July 24, 1918 (C. H. T. Townsend).

Differs from *Pelecotheca panamensis* in color only as follows: Black, silvery-white pollinose. Antennæ wholly black. Pollen of front, thorax and scutellum, as well as that of abdomen, silvery, without golden tinge. Outer pair of thoracic vittæ very heavy. Legs quite black. Tegulæ white. Wings nearly clear, the costa not clouded.

***Trichoduropsis*, new genus.**

Genotype, *Trichodura recta* Schiner, 1868, Novara Dipt., 320-321.

Eyes bare. Arista plumose to tip. Apical cell open in tip. Cubitus near margin, with stump. Apical crossvein deeply bowed in. Hind crossvein a little nearer to cubitus than to small crossvein. Abdomen with long rather thin bristles, a median marginal pair on last three segments and no discals. Male abdomen narrow and evenly tapered to tip, the anal segment short-caudate and with various bristles on the tail.

Gymnaporia, new genus.

Genotype, *Gymnostylia fasciata* Macquart, 1848, Dipt. Exot., Suppl. III (II suite), 52, pl. 6, f. 3.

Eyes bare. Arista pubescent half way. Frontals stopping at base of antennæ. Third antennal joint of male three times second. Male frontalia pinched out posteriorly, the eyes approximated. A median discal pair of bristles on third and fourth abdominal segments. Anal segment of male produced posteriorly, notched in ventral profile.

Oxyaporia, new genus.

Genotype, *Gymnostylia ornata* BB., 1889, Musc. Schiz., I, 60, f. 212.

Arista bare, long, thickened half way. Third antennal joint of male elongate and narrow, the second joint short. Eyes bare. Frontals descending three bristles below base of antennæ. Male front very narrowed. Female with two proclinate orbitals, male without. Parafacialia hairy. Apical cell open near tip. No stump at cubitus. Median discals on last three abdominal segments, median marginals on all segments. Anal segment of male short-conical.

Uraporia, new genus.

Genotype, *Aporia caudata* Schiner, 1868, Novara Dipt., 320.

Eyes thickly hairy. Male frontalia triangular. Front tibiæ of male shorter than the tarsi. A median marginal pair of bristles on each abdominal segment, but no median discals. Anal segment of male caudate, notched in ventral profile, the tail with many bristles.

Protaporia, new genus.

Genotype, *Protaporia galerucæ*, new species.

Clypeus slightly depressed below crests of facialia. Eyes practically bare. Frontals closely set, diverging three bristles below base of antennæ, posterior three pairs or so reclinate in male. No proclinate or reclinate orbitals in male. Arista microscopically pubescent half way or so. Ocellars present, weak. Costal spine present. A median marginal pair on first three abdominal segments, a medial discal and median anterior pair on last three segments. Anal segment of male very short-caudate, the tail stublike.

Protaporia galerucæ, new species.

Length, 7 mm. One male labeled "Parasite in *Galeruca semi[rufa]* 21, 12, 08." Evidently from the region of the Caucasus.

Black; face, cheeks, parafrontalia and orbits thinly silvery pollinose. Frontalia and palpi brown. Prescutum silvery, leaving four vittæ, the inner ones narrow and almost fused with the blotchlike outer ones. Postscutum, scutellum and abdomen showing pollen only in very oblique view, the second abdominal segment and bases of third and anal segments being more plainly pollinose. Legs brown. Tegulæ white. Wings nearly clear.

Nephoplagia, new genus.

Genotype, *Nephoplagia arcuata*, new species.

Belongs in *Voria* group. Eyes bare, descending short of level of tips of antennæ. Male front much wider than one eye; second antennal joint elongate, third joint much widened apically. Arista bare, short, thickened practically to tip. Male with two heavy verticals; four or five proclinate orbitals, of which only two are heavy and strong; and three reclinate orbitals, the hindmost divaricate. Strong ocellars present. Three facio-orbitals in line with fronto-orbitals. Apical cell open well before wingtip. Third vein bristled to beyond small crossvein. Last section of fifth vein fully half as long as preceding section. Hind crossvein strongly arcuate, outwardly convex.

about half way between small crossvein and cubitus. No median marginals on first segment, median discals on last three segments.

Nephoplagia arcuata, new species.

Length, 7 to 8 mm. Three males, Huascaray Ridge, Jaen Province, Peru, 7,000 feet, September 21 and 22, 1911 (C. H. T. Townsend).

Blackish-brown. Front thinly, face more thickly silvery-white. Second antennal joint and palpi fulvous, with fuscous shading. Thorax, scutellum and abdomen thinly silvery; four thoracic vittæ, the inner pair narrow; bases of last three abdominal segments more or less narrowly thickly silvery-white. Tegulae watery-white. Wings nearly clear, with three heavy fuscous clouds: One large from stigma across middle of discal cell; one smaller, barlike, on hind crossvein; and one, spot-like, on base of apical crossvein.

Gymnopalpus, new genus.

Genotype, *Gymnopalpus setipennis*, new species.

Allied to *Thelaira*. Palpi of female much swollen apically, wholly bare on swollen part. Arista thinly plumose to tip. Third antennal joint of female slender, four times as long as second. Eyes bare. Cheeks narrow, eyes descending to epistomal level. Parafacialia bare, narrow. Apical cell open or closed a little before tip. First vein bristled to tip, third about two-thirds way to tip. Macrochætæ heavy and erect, no median discals on abdominal segments.

Gymnopalpus setipennis, new species.

Length, 6.5 mm. Two females: One Los Amates, Guatemala, February 7, 1905 (Chas. C. Deam); the other without locality, collected by Mr. August Busck. Det. Coq. "*Chaetona pallida* Wulp."

Brownish to black; basal half of abdomen, all of coxæ and all but tips of femora clear yellow to tawny or fulvous. Head silvery-white, frontalia pale brown, palpi and base of antennæ pale yellow. Two thoracic vittæ, the pollen between them with

an olive shade. Median triangle of black on second segment, and one on first segment reversed. Bases of third and anal segments silvery-white and bare of microchætæ. Tegulæ nearly white. Wings faintly evenly smoky, well tinged with yellow.

Polygastropsis, new genus.

Genotype, *Polygaster brasiliensis* Townsend, 1917, Bull. Am. Mus. N. H., xxxvii, 224-225.

Differs from *Polygaster* by having fifth vein bristled nearly to hind crossvein, as well as in the other characters given in the description of the genotype.

Thelairophasia, new genus.

Genotype, *Thelairophasia transita*, new species.

Allied to *Thelaira* and *Masiphya*. Epistoma well produced below vibrissæ, strongly warped and nasute. Clypeus scarcely depressed. Facialia flattened nearly to plane of clypeus. Third antennal joint of male long and bulged on front border. Arista long, slender, microscopically pubescent. Two verticals and three reclinate orbitals in male. Parafacialia bare, narrowing below, as wide as facialia. Apical cell open well before tip. Median discals on intermediate segments, a strong median marginal pair on first segment.

Thelairophasia transita, new species.

Length, 8 mm. One male, Rio Charape, Jaen Province, Peru, 3,700 feet, September 19, 1911 (C. H. T. Townsend).

Brownish. Face and cheeks pale golden pollinose, parafrontalia deeply golden. Frontalia dark brown. Third antennal joint blackish, second joint rufous. Palpi pale fulvous. Mesonotum dull golden pollinose; four thoracic vittæ, inner pair very narrow. Bases and sides of last three abdominal segments silvery with pale golden tinge, most of disk of segments appearing brown pollinose in oblique view. Tegulæ pale watery-yellowish. Wings nearly clear.

Nephochaetona, new genus.

Genotype, *Nephochaetona mima*, new species.

Clypeus slightly depressed, epistoma slightly warped. Arista long, microscopically pubescent, thickened on basal fourth. Facialia bare, as wide as parafacialia, narrowing upward; the parafacialia bare and narrowing downward. Eyes thinly hairy. Frontals stopping at base of antennæ. Wings clouded, apical cell open a little before tip, third vein bristled to beyond small crossvein, hind crossvein in middle between small crossvein and cubitus. Macrochætæ erect. Palpi swollen and nude apically.

Nephochaetona mima, new species.

Length, 6 mm. One female, Huascaray Ridge, Jaen Province, Peru, 7,000 feet, September 21, 1911 (C. H. T. Townsend). Taken in company with specimens of an anthomyiid, which it counterfeits not only in wing clouds but also in facial and frontal characters.

Dark brown, slate-gray pollinose. Palpi very pale fulvous. Basal half of antennæ light rufous. Frontalia black. Four thoracic vittæ, the outer ones heavier. First three abdominal segments more or less shining blackish on disk. Tibiæ pale fulvous. Tegulæ glassy clear. Wings clear, with clouds on stigma, hind crossvein, apical crossvein, and end of second vein, the last two more or less confluent.

Erythromelana, new genus.

Genotype, *Erythromelana jacna*, new species.

Allied to *Thelaira*. Eyes thinly hairy, descending a little short of epistomal level. Frontals diverging two bristles below base of antennæ. No ocellars. Male vertex rather over one-sixth of head width, that of female but little wider. Only one vertical in both sexes. Male without, female with two proclinate orbitals; both sexes with two reclinate orbitals. Two sternopleurals and two postsuturals. Apical cell open a little before tip. Both sexes with a median marginal pair on first two segments and marginal row on last two segments; no median discals.

Erythromelana jaena, new species.

Length, 7 to 8 mm. One male and one female, Huascaray Ridge, Jaen Province, Peru, 7,000 feet, September 21, 1911 (C. H. T. Townsend).

Abdomen wholly fulvo-rufous in both sexes. Palpi fulvous. Face and orbits silvery. Antennæ, frontalia, postscutum and scutellum black. Prescutum black with thin silvery pollen, leaving five vittæ, the three inner ones narrow. Humeri and pleura silvery. Legs blackish, hind tibiæ of male and front and hind tibiæ of female fulvous on middle. Tegulæ glassy-yellowish. Wings smoky-yellowish in greater part.

Binghamimyia, new genus.

Genotype, *Binghamimyia reclinata*, new species.

Allied to *Thelaira*. Clypeus distinctly sunken below crests of facialia. Palpi not as long as third antennal joint, slender, subcylindrical. Arista bare, thickened nearly half way. Third antennal joint nearly three times second. Eyes bare. No ocellars. Frontals stopping about even with base of antennæ, last three pairs reclinate and strong. Parafacialia bare, strongly narrowed below. Cheeks about one-fifth eye length in male. Two sternopleurals and three postsuturals. Apical cell elongate, open a little before tip. Median marginal pair on first two segments, median discals on intermediate segments.

Binghamimyia reclinata, new species.

Length, 10.5 mm. One male, Santa Ana, Peru, 3,000 feet, August 3, 1911, collected by the Yale Peruvian Expedition, led by Dr. Hiram Bingham, in whose honor the genus is named.

Abdomen rufous, more or less broadly blackish on disk of segments. Head silvery pollinose with a slight golden tinge. Palpi very pale yellowish or straw-color, fuscous on base. Antennæ blackish, second joint obscurely fulvous. Frontalia brown. Thorax, scutellum and the blackish disks of abdominal segments pollinose with faint golden tinge; two narrow inner and two broad outer thoracic vittæ blackish. Legs dark brown. Tegulæ nearly white. Wings clear.

Comyopsis, new genus.

Genotype, *Comyopsis fumata*, new species.

Facialia flat, narrowing above; parafacialia bare, narrowing a little below, averaging as wide as facialia. Arista short, thinly plumose to tip. No proclinate or reclinate orbitals in male, verticals vestigial and pilelike. Male front narrowed almost to a line. Eyes thinly short-hairy, descending about to epistomal level. Apical cell open just before tip. Third vein bristled to small crossvein. No median discals on abdomen.

Comyopsis fumata, new species.

Length, 5 mm. One male, Chinandega, Nicaragua (Baker).

Shining brownish-black. Face ashy. Palpi fulvous apically, brown on base. Mesoscutum brownish-gray pollinose in oblique view, leaving two narrow inner and two wider outer vittæ, more distinct on prescutum. Second and third abdominal segments thinly silvery on sides basally. Legs dark brown, the tibiæ lighter. Tegulæ and wings fuscous.

Huascarodexia, new genus.

Genotype, *Huascarodexia pulchra*, new species.

Belongs in *Zelia* group. Eyes thickly long-pilose. Arista short-plumose. Parafacialia very wide, bare. Female with two verticals, two proclinate and one reclinate orbitals. Ocellars present. Four strong postsuturals, three sternopleurals, two postintraalars, two preacrostichals, and two postacrostichals. No strong erect median discals on intermediate segments but some weak appressed ones.

Huascarodexia pulchra, new species.

Length, 10 mm. One female, Huascaray Ridge, Jaen Province, Peru, 7,000 feet, September 22, 1911 (C. H. T. Townsend).

Head silvery-white pollinose, frontalia dark brown; antennæ blackish, basal half more or less rufous; palpi fulvous. Mesoscutum silvery-white pollinose, leaving four soft black-brown vittæ which are coalesced on front half of postscutum, the two narrower middle ones continued in a single median vitta of

same width on hind half of postscutum. Scutellum soft brown-black on base, faintly pollinose on disk and apically. Abdomen soft brown-black, narrowly rufous laterally on disk of first two segments, with a large silvery-white more or less triangular spot on each side of each segment, these spots subconfluent on bases of last three segments. Legs brown. Tegulæ white. Wings clear.

Eunemorilla, new genus.

Genotype, *Eunemorilla peruviana*, new species.

Allied to *Masiphya*. Palpi elongate, slightly enlarged apically in the male. Arista short, thickened over half way. Eyes pilose. Frontals descending three or four bristles below base of antennæ. Parafacialia bare except hairs next lowest frontals. Male with one vertical, two reclinate orbitals and no proclinales. Ocellars present. Second antennal joint elongate, third about one and one-half times second. Cheeks less than one-third eye length in male. Four sternopleurals and four postsuturals. Three preacrostichals, three postacrostichals, three postintraalars. Apical cell open well before tip. Hind tibiæ ciliate. No median discals on intermediate segments.

Eunemorilla peruviana, new species.

Length, 8 mm. One male, Santa Eulalia, Peru, 3,500 feet, December 11, 1913 (C. H. T. Townsend).

Rufous-brownish. Face silvery, with ashy reflections. Cheeks and parafrontalia golden-ashy. Frontalia light brown. Palpi fulvous, brownish basally. Thorax, scutellum and abdomen golden-ashy pollinose, except four narrow black thoracic vittæ, basal abdominal segment and median markings of other segments brown, and lateral chestnut clouds of segments two to four. Legs brown. Tegulæ watery-tawny. Wings clear.

Bonellimyia, new genus.

Genotype, *Tachina haemorrhoidalis* Fallen, of which *Bonellia tessellans* R.D. is a synonym. New name for *Bonellia* Rob. Desv., 1830, *Essai Myod.*, 56 (nec Rol., 1822) preocc.

Argentoepalpus, new genus.

Genotype, *Epalpus niveus* Townsend, 1914, Ins. Ins. Menstr., II, 136-137.

Second aristal joint elongate. Scutellum and abdomen with heavy spines. No median marginals on first segment; no complete marginal row on second, but closely-set row of about six to eight marginals in middle, with median discal row of about six, and median anterior row of about four; third segment with closely-set marginal row, median discal row of about eight, and one median anterior pair in female but not in male; anal segment thickly spined on posterior half. The four segments bear thick lateral discal spine bunches, and the sternites are heavily spined. Three sternopleurals, three postintraalars, four postsuturals, three preacrostichals, three postacrostichals, two lateral scutellars and one weak divergent apical pair of scutellars in addition to the erect spines. Two to three proclinate orbitals in female, and one reclinate orbital in both sexes. No ocellars. Two strong verticals in both sexes.

Acronaristopsis, new genus.

Genotype, *Acronaristopsis bahamensis*, new species.

Allied to *Schisotachina*. Clypeus and facialia welded into a single broad flat subtriangular plate. Parafacialia extremely narrow, sublinear. Eyes bare. Cheeks about one-third eye length, and vertex over one-third head width in female. Proboscis very short, palpi short and stubby. Second antennal joint somewhat elongate, third joint of female simple and one and one-half times second. Ocellars divaricate. Apical cell narrowly open just before tip. First vein spined to tip, third vein half way or more to tip, fifth vein half way to hind cross-vein. No median macrochaetæ on first two segments. Arista short, thickened three-fifths way, second joint long.

Acronaristopsis bahamensis, new species.

Length, 6 mm. One female, Nassau, Bahamas (Dr. H. G. Dyar).

Blackish-brown, very thinly silvery pollinose. Antennæ and palpi dull fulvous. Four faint thoracic vittæ, the inner

pair narrower and better marked. Anal segment and bases of second and third segments pollinose. Tegulæ nearly white. Wings clear.

Ossidingia, new genus.

Genotype, *Ossidingia ornata*, new species.

Head wider than high, moderately long. Clypeus slightly depressed, wide, but little narrowed above. Epistoma warped slightly, cut off short just below vibrissæ. Facialia bare; proboscis short; palpi long, subcylindrical, bowed, scarcely thickened apically. Second antennal joint elongate, third joint about one and one-half times second. Arista very long, bare, slender. Eyes thickly pilose, descending to vibrissal level. Frontals diverging five bristles below base of antennæ. Two verticals, two proclinate and two or three reclinate orbitals. Ocellars present, strong, proclinate. Parafacialia bare. Two sternopleurals, three postsuturals; acrostichals present. Apical cell open well before tip. First abdominal segment with a median marginal pair; second with two median marginal and one median discal pairs; third with marginal row and two median discal pairs; anal segment sparsely set with bristles over disk.

Ossidingia ornata, new species.

Length, 8 mm. One female, Ossidinge, Cameroons, West Africa, June, 1915 (Lient. A. W. Jobbins-Pomeroy).

Head silvery-white; the frontalia, antennæ, palpi, spot on vibrissal angles, spot at anterior end of frontal row, broad band across front before ocellar triangle, greater part of occiput, broad median vitta of prescutum and oblique oval spot each side of it, narrower median vitta of postscutum and band of confluent spots next suture, base of scutellum, most of first abdominal segment, interrupted median abdominal vitta, and spot on each side of second to anal segments soft brown-black to velvet-black. Last half of anal segment bright fulvous-yellow, reducing the black vitta and lateral spots. Legs dark brown, underside of femora silvery. Tegulæ conspicuously clear honey-golden. Wings clear.

Obolocera, new genus.

Genotype, *Homoconychia rapæ* H. E. Smith, 1917, Psyche, xxiv, 139-140.

Head much wider than high, but very short. Clypeus a little depressed; epistoma cut off short, but warped. Facialia obliquely flattened, finely short-ciliate on outer edge about half way above vibrissæ. Proboscis short, labella large; palpi elongate, thickened apically. Antennæ inserted about on eye middle, second joint short; third joint in male irregularly sub-circular, flattened or compressed laterally into a thin plate whose greater length is over three times the second joint. Arista short, porrect, thickened over half way, second joint longer than wide. Eyes pilose. Frontals diverging three or four bristles below base of antennæ, about eight in number, all reclinate. Male with two strong verticals, but neither proclinate nor reclinate orbitals. Ocellars present, proclinate. Para-facialia in plane of clypeus, bare on lower half. Three sternopleurals, three postintraalar, four postsuturals, three preacrostichals and three postacrostichals. No costal spine; apical cell open a little before tip. Hind tibiæ ciliate, male claws short. Median marginal pair on first abdominal segment, median marginal and median discal on second, marginal row and median discal pair on third, marginal and discal rows on anal segment.

Chlorometaphyto, new genus.

Genotype, *Gymnochaeta vivida* Williston, 1886, Tr. Am. Ent. Soc. XIII, 302.

Clypeus slightly sunken, epistoma wide and only slightly warped. An outer row of frontals anteriorly more or less developed in the female. Third antennal joint of female little longer than second, that of male about one and one-half times second. Costal spine strong, a strong stump at cubitus. Hind crossvein close to cubitus. Sternite V of male greatly elongated and deeply cleft.

Euptilopsis, new genus.

Genotype, *Ptilopsis sermaculata* Robineau-Desvoidy, 1863,

Posth. II, 273. Change of name for *Ptilopsis* R. D. (1863) preocc. by Kaup. (1851).

Differs from *Strongygaster* mainly in the pilose eyes, male frontalia pinched out behind and parafrontalia reduced to a line, and apical cell open.

Vanderwulpella, new genus.

Genotype, *Xanthomelana anceps* Wulp, 1903, Biol. C.-A., Dipt. II, Suppl., 455, pl. 13, fig. 15.

Eyes bare, subcontiguous in the male; male front triangular. Third antennal joint but little longer than second. Apical cell long-petiolate. Fourth vein evenly arcuate at bend. Hind crossvein nearer to small crossvein than to bend of fourth vein. Abdomen ovate, short, convex, five segments visible from above. Abdominal macrochætæ only marginal, moderately strong and long. Male claws elongate.

Named in honor of Mr. F. M. van der Wulp, who has described a large number of exceptionally interesting muscoid forms.

Girschneria mirabilis, new genus and species.

Name for "Tachinine gen. et sp.", Girschner, 1885, Ent. Nachr., xi, 3-6, figs. 4, 4a-4e; and xii, 20-21.

Over thirty years ago Girschner, in whose honor the genus is named, described and figured the generic and specific characters of this remarkable Sisyropine form. Only one specimen, the original, is so far known and is evidently the male. It possesses five pairs of long feathered bristles on the head, three cruciate pairs being inserted on the edges of the forward half of the frontalia, and two divaricate pairs on the facialia at about arisal level. The upper pair of the two on facialia is white while all the others are black. Whether the female also possesses these feathered bristles is unknown but unlikely. They are distinct from the frontal bristles, which are always inserted on the parafrontalia. They were believed by Mik to be of extraneous origin, but are unquestionably structures of the fly.

SYNONYMY

In the course of the work, the following synonymy has come to light:

Trongia Towns. equals CATAPICEPHALA Macq., genotypes congeneric.
Araba tergata Coqt. equals EUARABA GRISEA RD.

Ophelia RD. (1830) preocc. equals ANICIA RD. (1863), genotypes congeneric.

Metopilla Rdi. equals TAXIGRAMMA Macq., genotypes congeneric.

Hoplocephalella Villen. apparently equals LAMPROMETOPIA Macq. male.

Notochaetopsis Towns. equals ACANTHODOTHECA Towns., genotypes not generically separable in male.

Phasiopteryx BB. equals ORMIA RD., genotypes congeneric.

Melaleuca spectabilis Wulp gen. et sp. equal ZELIA GRACILIS Wd. female.

Leptoda Wulp equals ZELIA RD. male.

Paranaphora Towns. equals ERVIA RD.

Hypostena gracilis Coqt. equals ERVIA TRIQUETRA Oliv. (small male).

Neohypostena Towns. equals ERVIA RD.

Eggeria Rdi. (1862) preocc. equals PEYRITSCHIA BB. (1889), genotypes congeneric.

Parodomyia paradoxa Towns. gen. et sp. equal THELAIRODES VITTIGERA Big.

Clinoneura BB. equals PTILODEXIA BB., genotypes congeneric.

Dimasicera nitida Towns. gen. et sp. equal PHAENOPSIS ARABELLA Towns.

Eusignosoma nigrum Towns. is subspecies of *Micropalpus rufipennis* Macq., genotype of EPALPUS Rdi.

EUSIGNOSOMA aureum Towns. equals *Micropalpus macula* Macq.

Bercaea RD. equals STEPHANOSTOMA Lenz, genotypes congeneric if not conspecific.

Eufabricia flavicans Towns. gen. et sp. equal ARCHYTAS DIAPHANA Fab.

Neoarchytas Towns. equals NEMOCHAETA Wulp, genotypes perhaps only subspecifically distinct and quite certainly congeneric.

Pseudodidyma Towns. equals MONOCHAETA BB, genotypes congeneric.

Eugymnochaeta Towns. equals CHRYSOTACHINA BB, genotypes congeneric.

NEW NORTH AMERICAN PHORIDÆ OF THE
GENUS APHIOCHÆTA¹*(Diptera)*

BY CHARLES T. BRUES

The species described in the present paper are in part from the Northwest, collected by Professor A. L. Melander, and from several localities in the Eastern States. I have also been able to recognize with reasonable certainty several European species not hitherto known to occur in North America and notes on these have been included.

Five of the species described as new have the anterior tarsi strongly thickened and are on this account easily distinguished from the bulk of the North American members of the genus. Only two others of this group have hitherto been known from this continent and one from the West Indies, although a considerable series have been found in Europe.

Aphiochæta dilatata, new species.

Male. Length 1.5 mm. Black, legs dark brown, somewhat lighter on the tibiæ and tarsi; palpi pale brown; halteres black; pleuræ varied with dark brown; wings faintly brownish, almost hyaline, heavy veins fuscous. Front one-fourth wider than high, not shining and rather strongly hairy between the large bristles, especially at the middle below; four proclinate bristles of about equal size, the upper ones but little above the lower ones and twice as far apart, occupying nearly one-third the width of the front; lower reclinate bristles set with the inner one far from the eye and much below the outer one which is next to the eye; upper reclinate row distinctly curved down medially, its four bristles equidistant with the lateral ones very close to the eye; ocellar tubercle well developed; median frontal groove not very well marked. Antennæ noticeably enlarged, the diameter of the third joint equal to the greatest width of the eye; arista one-third longer than the height of

¹ Contributions from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 148.

the front. Palpi rather small, with four or five strong bristles at tip. Mesonotum subshining, rather densely hairy; scutellum semicircular, with two strong bristles. Propleura with several strong bristles next the coxa and several minute ones below the spiracle; mesopleura with an area of small bristles above and one long backwardly directed one at the lower hind angle of the area of small ones. Abdomen with some conspicuous bristly hairs near the apex, continued on the lower half of the sides and anterior ventral angles of the hypopygium; apex of hypopygium below with an asymmetrical hook-shaped clasper originating on the left side, extending to the right side and there curved forward. Anal organ short and stout, densely hairy, its apical pair of bristles small. Legs slender; hind femora simple; front tarsi thickened throughout, the metatarsus as stout as the tibia; setulæ of posterior tibiæ minute, not developed at all on the basal half; tibial spurs unusually weak. Costa slightly less than half the length of the wing, its cilia short, especially on the basal half; first section about one-fourth longer than the second and third combined; second very little longer than the third; costa apically and third vein unusually thick, the cell at the furcation of the third very small; fourth vein slightly curved throughout; fifth nearly straight, strongly divergent from the fourth apically; seventh long, distinct; all light veins very weak at apex, the fourth and fifth also at the base; wings broader than usual, especially on the apical half.

Female: Differs only in its smaller antennæ, and in having the first section of the costa a trifle longer and the wing somewhat narrower.

Type male and paratype female from Moscow Mountain, Idaho, June 17 (Melander).

Similar to the European *A. tarsalis* Wood, which, however, does not have the antennæ enlarged in the male.

Aphiochæta scopalis, new species.

Male. Length 2.0 mm. Deep black, legs beyond the coxæ piceous, the front pair more brown. Wings hyaline, heavy

veins very dark. Front slightly broader than long, appearing broader as the margin on the sides is more deeply excavated on account of the large antennæ. Lower pair of proclinate bristles greatly reduced in size, upper ones moderately large, separated by nearly one-third the width of the front; lower reclinate bristles set close together near the eye, at almost the same level; upper row nearly straight; ocellar tubercle and median frontal groove well developed. Antennæ considerably enlarged, half as long as the eye, with a slightly pubescent arista one-half longer than the height of the front; cheeks each with a row of six strong bristles extending from the lower angle toward the antenna, the upper ones smaller, but still large. Mesonotum with a pair of sharply differentiated dorsocentral macrochætæ; scutellum broad and short, with four very long slender bristles, placed as a pair close together at each posterior angle. Propleura with several strong bristles near the anterior coxa and several very small ones just below the spiracle; mesopleura with a patch of small bristles of equal size above. Abdomen with a few scattered hairs and some more conspicuous ones on the sides below. Hypopygium of moderate size, shining toward the base; anteriorly below with a dense transverse tuft of very strong, straight, stiff bristles; behind this on the ventral surface with two longitudinal rows of delicate hooked hairs extending to the apex; above and on the sides, except at base, minutely rugulose and finely hairy; anal organ short and stout, with a few very fine hairs. Legs slender; front tarsi strongly enlarged, the metatarsus slightly broader than the widest part of the front tibia; hind femora with a series of delicate, but quite noticeable curved hairs along the lower edge; setulæ of hind tibiæ fine and closely placed, more distinct near the middle. Costa about two-fifths the wing length, its cilia moderately long and rather closely placed on apical half, shorter basally; first section about one-third longer than the second and third combined; second nearly twice as long as third; light veins but little curved, the fourth not recurved at apex, the seventh long; light veins all distinct, but not strong.

Type from Lacouner, Washington, May 23, 1908 (Melander).

This species is remarkable for its stiffly bristled and otherwise elaborate hypopygium, and could not be confounded with any other. In Wood's table of British species it will run in the neighborhood of *A. involuta* Wood, from which it differs at once in its large antennæ and in the hypopygium.

Aphiochæta palpata, new species.

Male. Length 1.5 mm. Black, legs brown. Middle and hind legs, except trochanters, very dark, almost piceous; basal half of front femora nearly as dark; apical half and their tarsi pale yellowish; other tarsi light brown; palpi black above; dark brown below; halteres black; wings hyaline, heavy veins piceous. Front as broad as long; subshining, with the fine hairs unusually stout, especially in the middle below where some are nearly half as long as the macrochætæ; upper proclinate bristles separated by one-third the width of the front, lower ones of the same size, much closer together; inner bristle of lower row nearer to the eye than to the proclinate bristle and well below the outer bristle which is next the eye; upper row slightly curved down medially, its bristles equidistant; set above the upper third of the front; ocellar bristles larger than the other; ocellar tubercle and median frontal groove well developed. Antennæ of moderate size, with long pubescent arista. Palpi small and slender, their bristles numerous but not very large; cheeks each with a pair of large bristles and a row of strong ones leading along the eye margin toward the antenna. Mesonotum rather shining, densely hairy; two scutellar bristles. Propleura with several bristles near the base of the coxa and with numerous small ones behind the spiracle; mesopleura with a patch of small, nearly equal bristles above. Abdomen dull black, with a few minute bristle-like hairs along the sides. Hypopygium small, with a row of three or four bristly hairs on each side above and a larger one at each lower anterior angle; lower posterior angle with only an extremely minute hair; lamella small, slender, with a pair of upcurved

bristles at tip. Anterior tarsi strongly thickened, the metatarsus as thick or barely thicker than the broad apical part of the tibia, the latter densely hairy on its outer edge, but without distinct bristles or setulæ; setulæ of hind tibia very small, delicate and closely placed, their femora simple below. Costal vein ending distinctly before the middle of the wing; its bristles short and closely placed; its first section one and one-half times as long as the second and third combined; third two-thirds as long as the second; fork obtuse, curvature of fourth vein slight; its apex nearly straight and not recurved; fifth and sixth each slightly bisinuate; seventh very weak, almost straight.

Type from Riverton, New Jersey, June 18 (Johnson); one paratype from Chicago, Illinois, June 6, 1903 (Melander), and another from Falls Church, Virginia, July 4 (Banks).

This species is most nearly related to two European species described by Wood. From the first of these, *A. humilis*, it differs in venation and in lacking the stubby hairs on the hind femora as well as in the reduction of the lower post-antennal bristles. From *A. crassipes* it differs greatly in venation, and in the development of the lower post-antennal bristles, besides being much larger.

***Aphiochæta pulla*, new species.**

Male. Length 2.0 mm. Black, with a brown tinge to the mesonotum; pleuræ brown, lighter below and anteriorly; palpi brownish yellow; legs dull, light yellow, darker on the tarsi; halteres pale yellow, darkened at tips, anal process honey-yellow; wings distinctly tinged with brown; venation fuscous, the light veins very distinct. Front slightly shining, as long as broad, its bristles large; lower proclinate bristles three-fourths as long as the upper and more closely placed; upper occupying nearly one-third the width of the front; bristles of lower reclinate row close together; the outer one next the eye and set but little above the inner one; upper row but little curved down medially, the inner bristles farther from one another than from the lateral ones; ocellar tubercle and median frontal groove well developed. Antennæ moderate, arista

one-half longer than the front, not strongly pubescent; palpi with five or six strong bristles; cheeks each with two large bristles, the series extending from these toward the antenna weak. Mesonotum distinctly shining; scutellum with two bristles. Propleuræ with several strong bristles next to the fore coxa and a couple of weaker ones below the spiracle; mesopleura above with a patch of small bristles of approximately equal size. Abdomen rather conspicuously bristly on the apical portion of each segment, the bristles on the basal segments very small, but becoming larger on the last three segments, especially the sixth which bears on the side eight or ten long slender bristles as well as a number below. Hypopygium small with a nearly vertical series of fine closely-set bristles on the side and a tuft of fine hairs below at tip; anal process covered with long fine hairs as long as the apical pair, which is smaller than usual. Legs slender, except the anterior tarsi which are strongly flattened, especially the metatarsus, which is fully as wide as the broadest part of the anterior tibia. Posterior femora slender, simple, not fringed beneath, their tibiæ without distinctly differentiated setulæ. Costal vein reaching to the middle of the wing, with very long, moderately strong bristles, each about as long as the last section of the third vein; first section of costa distinctly, but not much longer than the second and third combined; third section two-thirds the length of the first; fourth vein weakly curved at base, nearly straight beyond, not recurved at tip; fifth, sixth and seventh nearly straight, the seventh long and strongly developed.

Type from Moscow Mountain, Idaho, September 9, 1908 (Melander).

This would run in Wood's table (Ent. Month. Mag., vol. 20. p. 114 (1909)) to *hortensis* Wood, except that the halteres are not black. It differs from that species by the bristly apex of the abdomen and the neuration. Otherwise the two are very similar and undoubtedly closely related.

Aphiochæta capillaris, new species.

Female. Length 2 mm. Black, slightly brownish on the pleuræ; legs piceous, distinctly yellowish basally on the two posterior pairs and the front pair entirely pale yellowish; palpi yellow; posterior margins of abdominal segments pale; halteres black; wings hyaline, with pale venation. Front as broad as high; four proclinate bristles, the lower pair noticeably weaker than the upper and placed close together far below them; upper pair separated by one-third the width of the front; inner bristle of lower reclinate row placed far below the outer one and much further from the eye; upper row straight, placed higher on the front than usual; ocellar tubercle very prominent; median frontal groove present, but not very pronounced; antennæ small, brown; arista thinly pubescent, one-half longer than the front; palpi moderate, with strong, rather short bristles, cheeks each with two long macrochætæ. Mesonotum shining, with a pair of distinct, widely separated dorsocentral macrochætæ; scutellum broad, with two strong bristles behind and two much weaker ones laterally. Propleura with one strong and several weak bristles near the coxa and two weak ones below the spiracle; mesopleura with a patch of very small bristles above and one greatly enlarged, backwardly directed one at the posterior edge. Abdomen slightly hairy on the sides and near apex, but without prominent bristles at the sides of the second segment. Legs slender, the anterior tarsi greatly swollen, the metatarsus as thick as the thickest portion of the tibia and the following joints also strongly thickened; cilia of hind tibiæ distinct, but not large and placed rather far apart, weaker on the basal half. Costa extending just to the middle of the wing, with close-set rather short cilia, those on the basal half much shorter than those on the apical half; first division of costa distinctly longer than the second which is slightly more than twice as long as the third; fourth vein gently curved at base, nearly straight beyond and not recurved at the apex; fifth and sixth strongly divergent apically; seventh very weakly defined.

Type from Great Falls, Virginia, October 21 (Nathan Banks); paratype from Falls Church, Virginia, June 7 (Banks).

This is similar to *A. dilatata* Brues.

Together with the four preceding species it has the anterior tarsi enlarged. All the members of this group known from North America may be distinguished by the aid of the following key:

1. Scutellum with four equally strong bristles.....2
 Scutellum with only two bristles.....5
2. First division of costa noticeably longer than the second;
 costal fringe of moderate length.....3
 First division of costa about equal to the second; costal
 fringe very short.....*magnipalpis* Ald.
3. Halteres pale yellow; palpi of male much enlarged and with
 only minute bristles.....*projecta* Becker
 Halteres brown or black; palpi bristly as usual.....4
4. Costa two-fifths the wing length; hypopygium with very
 large bristles*scopalis* Brues
 Costa extending to the middle of the wing; hypopygium not
 noticeably bristly*californiensis* Malloch
5. Halteres black; costal cilia short.....7
 Halteres pale6
6. Costal cilia very long.....*pulla* Brues
 Costal cilia short.....*johnsoni* Brues
7. Mesopleural bristles of approximately equal size.....*palpata* Brues
 One mesopleural bristle enlarged, much longer and stouter
 than the remainder8
8. Posterior tibiae with well-developed setulae, front as high
 as broad*capillaris* Brues
 Posterior tibiae without distinct setulae; front one-fourth
 broader than high.....*dilatata* Brues

***Aphiochaeta centralis*, new species.**

Female. Length 2.3 mm. Black, the pleurae and legs very dark brown; front legs distinctly lighter; antennae brown-black; palpi dark yellow, much infuscated above; wings with a brownish cast, more pronounced apically; halteres black. Front about one-third broader than high, with large bristles; four proclinate bristles, the lower pair half the size of the upper and close to them although more approximate; upper

pair occupying one fourth the width of the front, inner bristle of lower reclinate row somewhat below the outer one and set near the post antennals so that it is equidistant from the eye margin and the median line; inner bristle of upper row equidistant, the median pair slightly lower than the outer one; ocellar tubercle and median frontal groove well developed. Antennæ rather large, with a nearly bare arista slightly longer than the front; palpi of good size, with strong bristles; proboscis extruded, but not thickly chitinized. Front strongly pollinose, with many small bristly hairs. Cheeks with several strong bristles below; post-ocular cilia unusually strong. Mesonotum shining, very bristly on the sides and behind, just before the scutellum. Scutellum with four very large, equal, marginal bristles. Peropleura with four strong bristles next the coxa and three weaker ones below the spiracle, bare between, mesopleura bare. Abdomen hairy near tip, but without distinct bristles on the sides of the second segment. Legs rather slender, the fore tarsi not at all thickened; hind tibiæ with weak, widely placed cilia on the apical half which become obsolete toward the base. Wings large, rather long and narrow. Costa extending distinctly beyond the middle of the wing, with short, closely placed cilia. First section of costa as long as the second and third combined; second nearly three times as long as the third; fourth vein sharply curved at base, straight beyond; fifth and sixth slightly sinuate; seventh rather long.

Type from Battle Creek, Michigan.

This species is related to *A. johannseni* Malloch, but the frontal chætotaxy is quite different, the costal fringe is not long, and it is a smaller species.

***Aphiochæta pleuralis* Wood.**

Entom. Monthly Mag., vol. 20, p. 117 and 146 (1909).

A series of ten specimens from Algonquin, Illinois, collected in October, 1895, by Dr. Nason, have been in my collection for a number of years. They represent both sexes and seem to be identical with this European form so far as I can judge

from Wood's very complete description. In Malloch's key to North American species it will fall near *ciliata* on account of the enlarged bristle (or two) on the mesopleura. *A. nasoni* recently described by Malloch (Bull. Brooklyn Ent. Soc., vol. 9, p. 58 (1914)) will also run to *ciliata* in the same key, but is very different from *pleuralis* although strangely enough it also was obtained by Dr. Nason at Algonquin, where the specimens of *pleuralis* were collected. I have additional specimens from Lyndon, Washington, July 29, 1908 (A. L. Melander), from Milton, Massachusetts, and from New Bedford, Massachusetts.

***Aphiochæta subpleuralis* Wood.**

Entom. Monthly Mag., vol. 20, p. 118 and 146 (1909).

I have a single male which I think is this species, as it departs in no way from Wood's comprehensive description. Wood says that this is a common and widely distributed species in Great Britain and that it is probably the *pulicaria* of Meigen and Becker, but not of Fallen. It seems probable, therefore, that this is an abundant palæarctic species that extends into western North America, particularly as Becker records his *pulicaria* from Siberia as well as Europe.

***Aphiochæta beckeri* Wood.**

Entom. Monthly Mag., vol. 20, p. 115 and 144 (1909).

A single male from Moscow Mountain, Idaho, sent me by Professor Melander, seems to be this species, hitherto known from Great Britain. The American specimen has the palpi almost black as well as the anal organ, and the tibial cilia, although well developed, could hardly be considered as sparse. I can make out no other differences, however, from Wood's description. The species is rather conspicuous on account of its very broad front, strong bristles on the head and propleuræ, the bristling of the hypopygium and the color and venation of the wings.

***Aphiochæta divergens* Malloch.**

Proc. U. S. Nat. Mus., vol. 43, p. 480 (1912).

I have two good series, comprising both sexes of this species. One lot collected by Dr. Nason at Algonquin, Illinois, years ago agrees perfectly with the original description but a series from Pullman, Washington, collected by Professor Melander, have the palpi somewhat infuscated instead of clear yellow, although otherwise indistinguishable. The Illinois specimens were taken in September and the Washington ones in May and September, some of them on windows. The anterior tarsi, especially the metatarsus, are strongly thickened in the male, but not noticeably so in the female.

***Aphiochæta glabrifrons* Wood.**

Entom. Monthly Mag., vol. 20, p. 27 and 62 (1909).

A single female undoubtedly belonging to this palæarctic species was taken at Framingham, Massachusetts, by Mr. C. A. Frost. The proboscis is swollen and very pale yellow like the anterior coxæ.

***Aphiochæta modesta*, new species.**

Male. Length 2 mm. Black; legs very dark brown, with the front pair much lighter and their coxæ light brownish yellow; palpi clear yellow; halteres black; anal organ deep yellow with dusky base; wings distinctly tinged with brown, heavy veins pale, but light veins rather dark. Front short, one-third broader than high; slightly shining. Two pairs of proclinate bristles, the lower pair much smaller and rather close together; upper pair very widely separated, occupying slightly more than one-third of the width of the front; bristles of lower row very close together next the eye, but the inner one distinctly lower than the outer one which is in line with the upper proclinate bristles; upper row of four nearly equidistant bristles, the middle pair a little lower than the lateral ones; ocellar tubercle and median frontal groove well developed. Antennæ somewhat under-sized, the arista long, slightly more than twice as long as the height of the front. Labrum not

prominent, palpi rather stout, with strong bristles. Cheeks each with two very strong bristles and a series of much smaller ones running up the orbits to the antennæ. Mesonotum rather elongate, shining; scutellum subtriangular, with only two bristles; dorsocentral bristles well differentiated, without any smaller bristles between them. Pleuræ shining, propleura with several bristles next the front coxa and a couple of minute ones just below the spiracle; mesopleura bare. Abdomen bare at base, but rather bristly near apex, especially on the sixth segment. Hypopygium of moderate size, not shining, with some bristles at the base, especially below, and also with several minute bristles near the base of the anal organ which is rather small and furnished with unusually stout hairs. Legs rather stout, but the tarsi all slender; hind femora without noticeable hairs below; cilia of hind tibiæ short, delicate and widely placed, very weak near the base and apex. Wings very long and narrow, with the costa extending well beyond the middle; its cilia short and very closely placed, extremely short near the base of the costa; first section slightly, but distinctly, longer than the other two combined; second half as long as the first and nearly three times as long as the third; fork of third vein rather acute and the cell long; fourth vein sharply bent at base, straight beyond and faintly recurved at tip; fifth slightly sinuate; sixth strongly so; seventh very long.

Type from Lyndon, Washington, July 29, 1908 (Melanders).

This species is not closely related to any described North American species; among the European species it would fall near *longiseta* Wood, from which it differs at once by its broader front, infuscated wings, and longer first section to the costa.

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Date of publication, January 11, 1919.

Insecutor Inscitiae Menstruus

A monthly journal of Entomology, edited by Harrison G. Dyar

Subscriptions and matter for publication should be addressed to Harrison G. Dyar, 804 B Street SW., Washington, D. C.

Authors' separates will be furnished at cost on orders accompanying the manuscript.

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